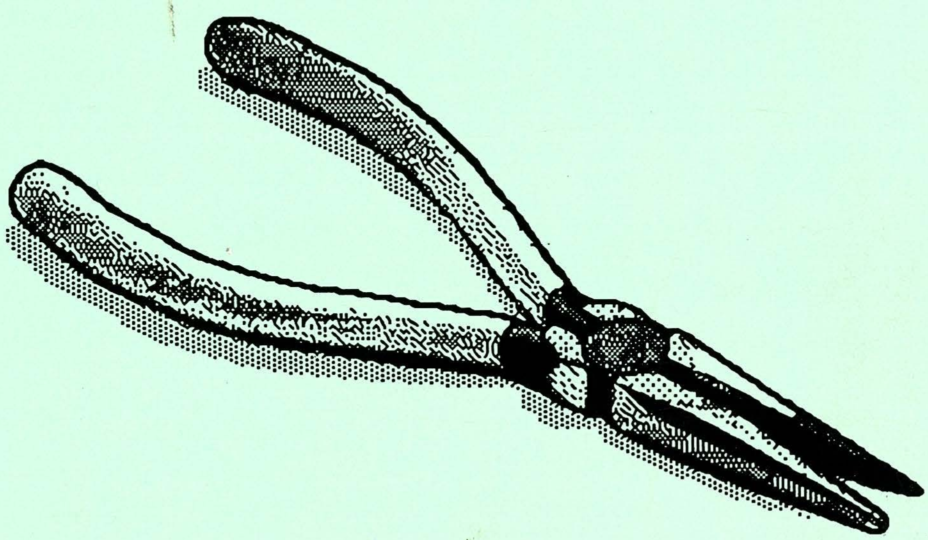
Number 3

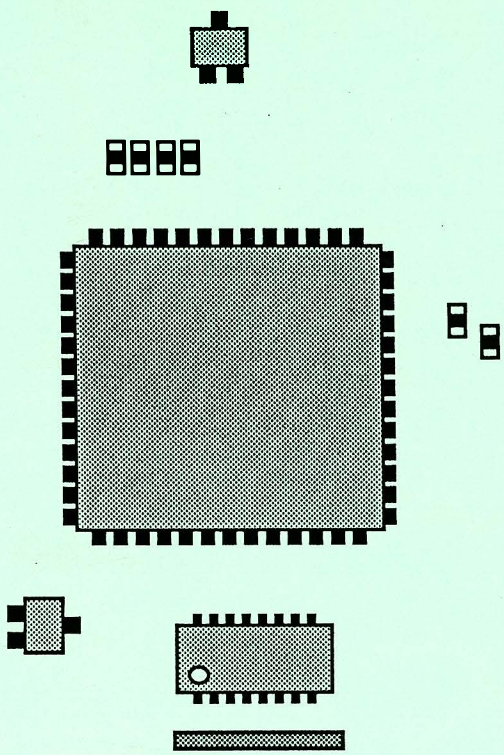
$19.95

Radio / Tech Modifications



Modifications for:

Alinco
ICOM
Kenwood
Yaesu
CB's
Scanners
Others



Este manual foi doado por PY2WFG Wilson
para ser scaneado e disponibilizado
GRATUITAMENTE a toda a comunidade

Scaneado em cores, 300 DPI (é o maximo que minha maquina faz, nao me batam) em uma copiadora Lexmark X864de, imagens tratadas com o programa IRFANVIEW e pdf gerado com o Adobe Acrobat XI Pro, usando Clearscan

Eu scaneio, trato e disponibilizo manuais gratuitamente meramente pelo prazer de faze-lo. Caso voce queira ajudar com manuais, insumos e ate mesmo uma merrequinha pra ajudar na conta de luz e na manutenção da maquina, entre em contato pelo email alexandre.tabajara@gmail.com (tambem é pix)

Obrigado a todos que ajudaram ate aqui

Os sites onde esses scans podem ser encontrados:
- www.bama.org
- http://tabajara-labs.blogspot.com
- http://tabalabs.com.br/esquemateca
- https://datassette.org/

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Distribuição **GRATUITA**. Respeite o meu trabalho.
São Paulo, Agosto de 2021

Radio / Tech Modifications

Artsci, Inc.
P.O. Box 1848
Burbank, CA 91507 U.S.A.
(818) 846-2298 FAX

Radio / Tech Modifications

NUMBER 3 10 9 8 7 6 5 4 3

Notice of Liability

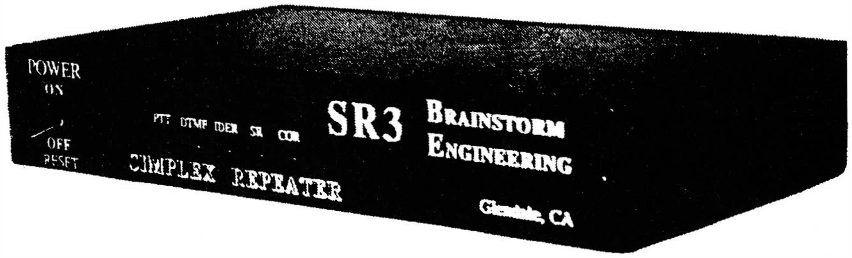
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Printed in the United States of America

Contents

SIMPLEX REPEATER !!



NO DUPLEXER NEEDED

NO DUPLEXER NEEDED

ALL YOU NEED IS THE SR3 A SIMPLEX RADIO AND A SIMPLEX FREQUENCY

SIMPLEX REPEATER MODE

In simplex repeater (SR) mode the SR3 will automatically record and playback a message. When the SR3 detects a carrier it will begin to digitally record the audio being received by the radio you have connected it to. When the carrier drops, the SR3 stops recording, and key's the radio (PTT) and transmits the audio it just recorded. This allows two or more mobiles to have a simplex conversation, when they are not in range of one another, but in range of the simplex repeater site.

VOICE MAIL MODE

When the SR3 is in voice mail mode, it can record and save a message for another station to retrieve at a later time when they come on the air. Retrieving a message can be accomplished by either entering DTMF command or pressing the PTT button. A message can be replayed as many times as desired.

REPEATER IDer MODE

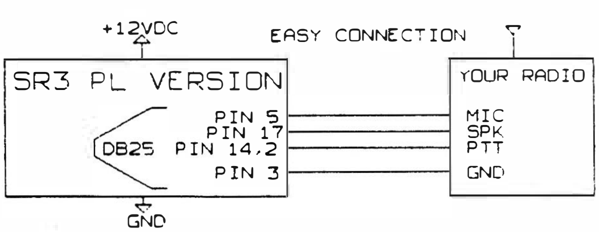
The SR3 can be connected to a repeater as a voice IDer. It has a built in timer adjustable from approximately 10 seconds to 20 minutes. You can configure it to use it's built-in timer, or use your repeater force the ID. With the use of SR3's built in DTMF decoder, you can easily change your ID message from any mobile radio at any time.

INTRODUCTORY PRICE $329 INCLUDES PL DECODER
$229 requires cor signal from radio.

Maximum message length is 64 seconds (with all 4 SRAM chips installed). SR3 comes with 1 SRAM chip installed with 16 seconds of message time. Each additional chip will hold an additional 16 seconds of audio.

Dimensions: 10.5" wide, 6" deep" 1.75"high

Voltage Supply 11.6VDC to 15VDC @ 200ma.



BRAINSTORM ENGINEERING
(818) 249-4383

Preface

This book is intended to be used as a reference guide for licensed Technicians. The text for each modification has been written with belief that the performing technician has experience with servicing modern radio equipment.

Attempts to perform these modifications by an inexperienced person may cause serious damage to the radio. Damage can occur by simply opening the radio case incorrectly. With the average repair cost of a damaged radio exceeding $150.00, it is a good investment paying a licensed technician to perform the modification.

Some of the modifications presented in this book have not been tested. However, most of the modifications have been, at one time or another, reviewed by the technicians at the radio manufacturing or distributing plants.

The authors have made every attempt to present all the available modifications. As new radios and modifications become available, they will be added to the next publication. Outside contributions are accepted for review.

Some of the modifications presented in this publication may allow a radio to operate outside its design range. Using a radio outside of its designed range may cause radio interference, equipment damage or may simply be illegal. If you have any concerns about the validity of the modification, or the purpose for a modified radio, do not perform the modification. Use your best judgement.

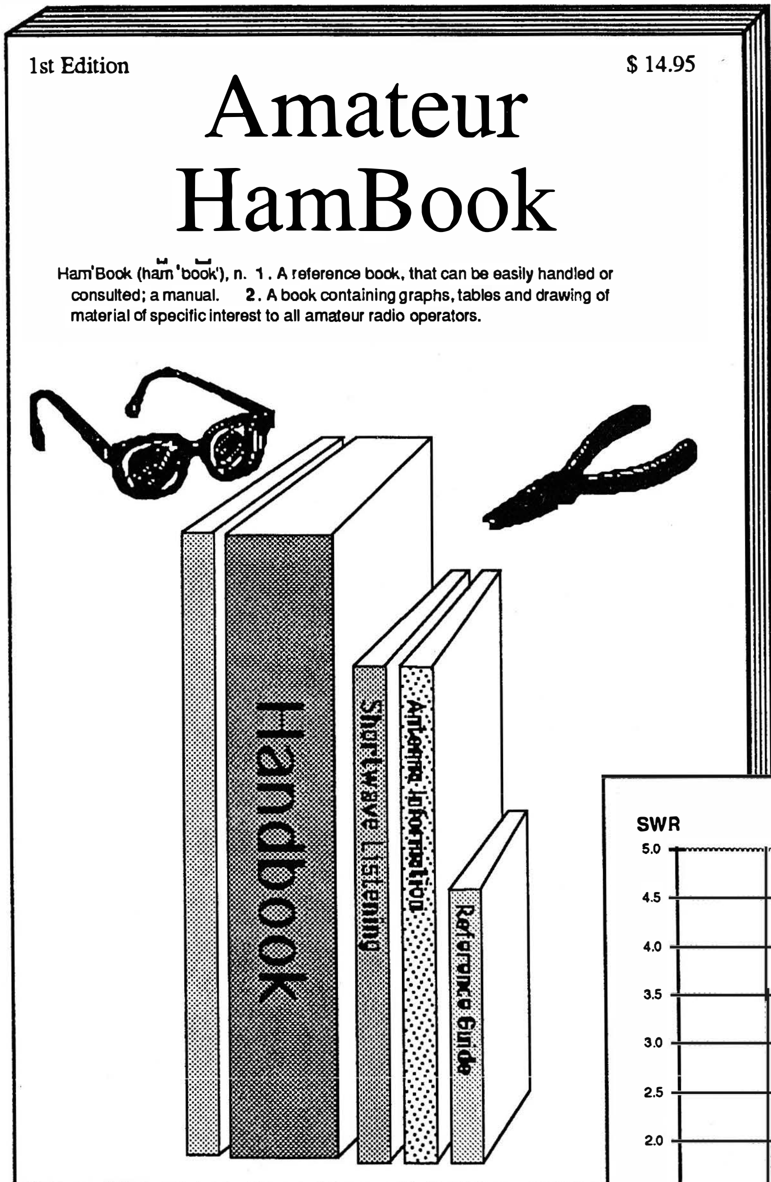
The exact Frequency range of a radio is almost impossible to predict. The tuning of the coils and VCO/VXO circuits can vary the range up or down 5-10 MHz. Most radios can range a total of 20 MHz.

A number of useful graphs, charts and tables are provided in the appendices.

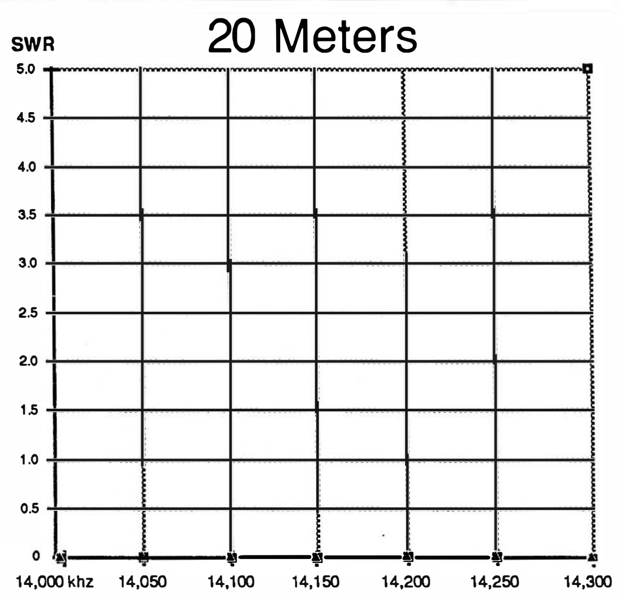
Technicians are welcome to forward comments, suggestion and new modifications.

Proof of Purchase
Number 3

A must for all Amateur radio Operators !!



- Shortwave Listening
- RTTY Frequencies
- Lat/Log of Major Cities
- Disaster Plans
- Antenna Construction
- Coax Tables
- Satellite Information
- Log Sheets
- Much More!



ANTENNA TUNER/ TRANSMITTER CONTROL SETTINGS

FREQUENCY	14,050 khz	14,100	14,150	14,200	14,250	14,300
INDUCTANCE						
CAPACITANCE						
PLATE						
LOAD						

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Radio / Tech Modifications

Kenwood Radio Modifications

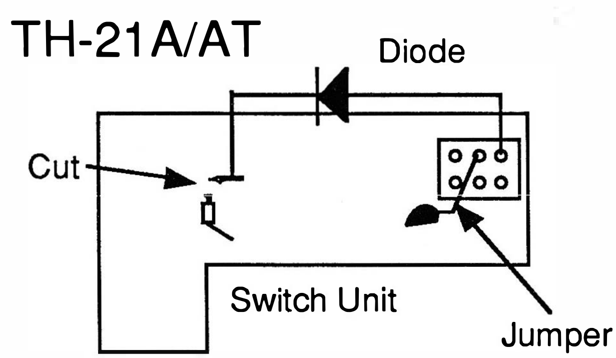
KENWOOD

KENWOOD TH-21A/AT

EXPANDED RF
140-159 MHz

1 Disconnect the Battery and antenna.
2. Remove Knobs, antenna nut ring and plastic top
3. Remove front panel.
4. Locate switch unit. (PCB X41-1590-00) This unit has the Vol, SQH etc.
5. Cut trace between R1 and D4,D5
6. Install a jumper from the common point of R11, R5 & 5C to the top corner of the tone switch.
7. Install a 1N914 diode from the center top pin of the tone switch to the end of resistor R1. (R2 was cut in step 5).
   Note: Cathode end of the diode goes to the tone switch top center pin.
   Cathode end of a diode has the line.
8. Reasemble the radio.

Depress the tone switch to receive from 140 to 149 MHZ
Tone switch off for 150 -159 MHz.

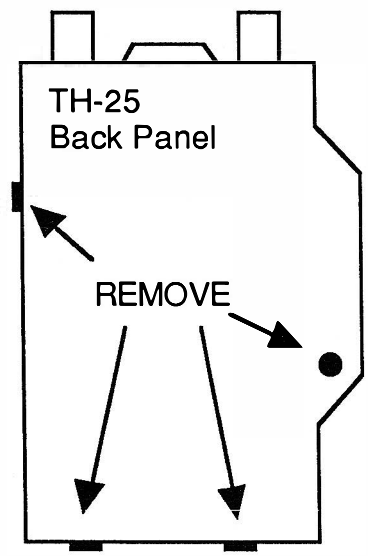


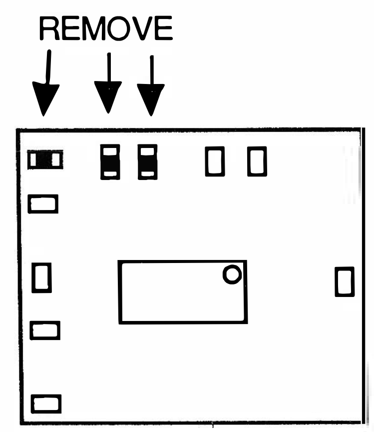
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KENWOOD TH-25AT

EXPANDED RF

1 Disconnect the Power and antenna.
2. Remove the Volume, Squelch and Tuning Control Knobs
3. Remove the Nut from the Volume control and Tuning Control.
4. Remove screw located by the PTT switch.
5. Remove screw by the speaker jack
6. Remove two screws from the battery plate.
7. Carefully pull the front panel from the radio. Do not break any wires.
8. Gently lift the top panel from the radio by pulling it forward and then upwards. The O ring on the BNC connector will cause some tension.
9. Rotate the top panel towards the front of the radio to expose the .75" X .75" board.
10. Remove Chip resistors R19, R20 & R21.
11. Reassemble the radio.
12. RESET the CPU.





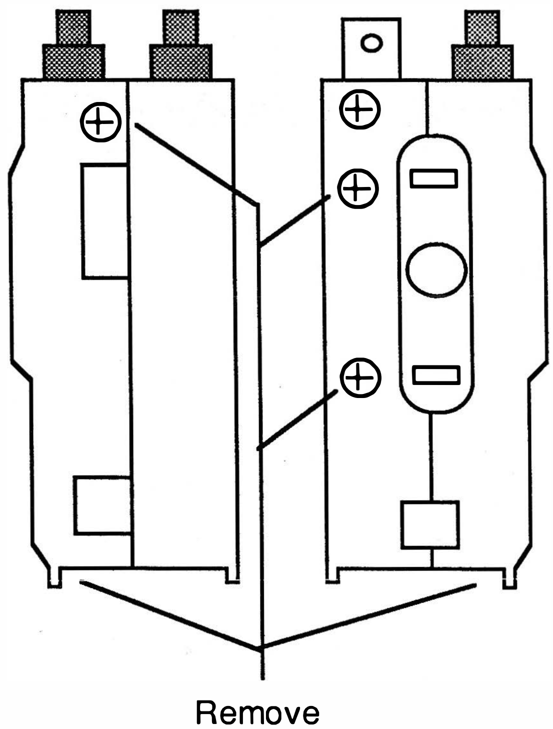
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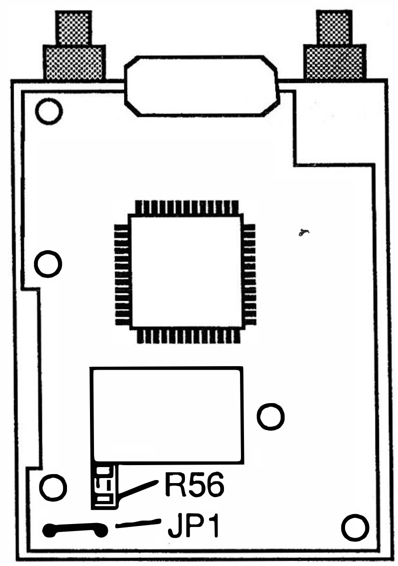
KENWOOD TH-26A

EXPANDED RF

1 Disconnect the Power and antenna.
2. Remove 3 screws from the case and 2 from the battery plate.
3. Open the radio.
4. Remove jumper JP1. Use a soldering iron the remove the jumper. Do not pull the jumper or overheat the board.
5. Unsolder and remove chip resistor R56.
6. Reassemble the radio. Carefully re-seat the O-Ring on the BNC connector.
7. Reset the Microprocessor. (Press and hold the [F] key and turn the power on.)

Note: Automatic offset selection will be disabled when this mod is performed.





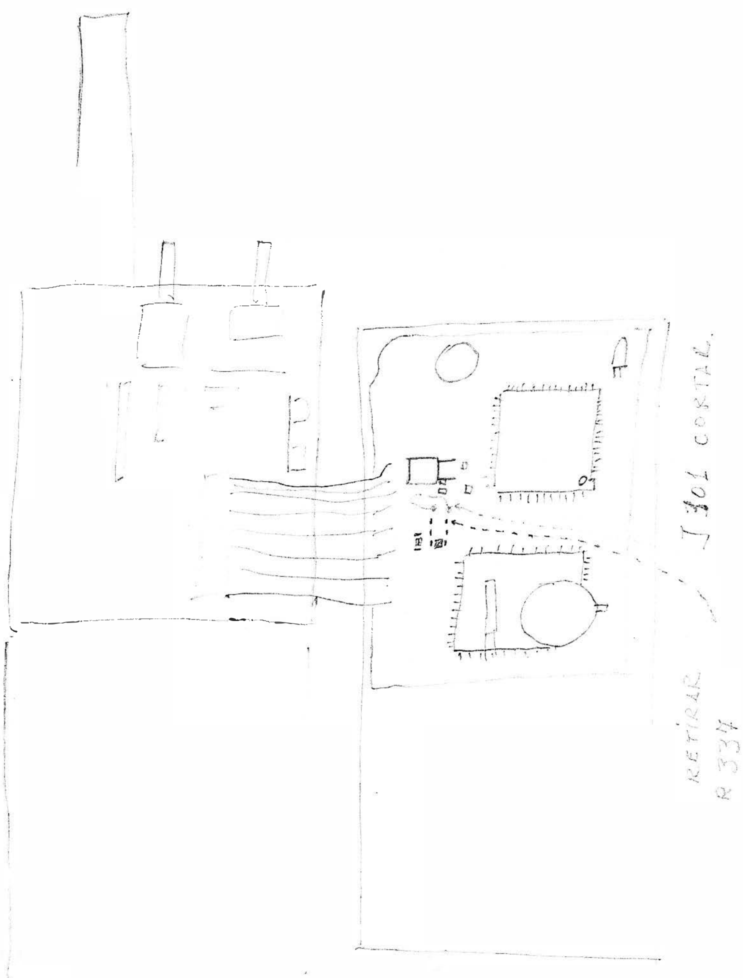
TH-26A

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KENWOOD TH-27A

EXPANDED RF

1 Disconnect the Power and antenna.
2. Remove 4 screws from the back panel.
3. Open the bottom of the front panel first and slide the panel downward.
4. Open the radio being careful not to break the flex cable.
5. Move the tone board out of the way to expose the green jumper wire located inside the front panel assembly.
6. Cut the GREEN Jumper wire.
7. Reassemble the radio. Carefully re-seat the O-Ring on the BNC connector.
8. Reset the Microprocessor. (Press and hold the [M] key and turn the power on.)

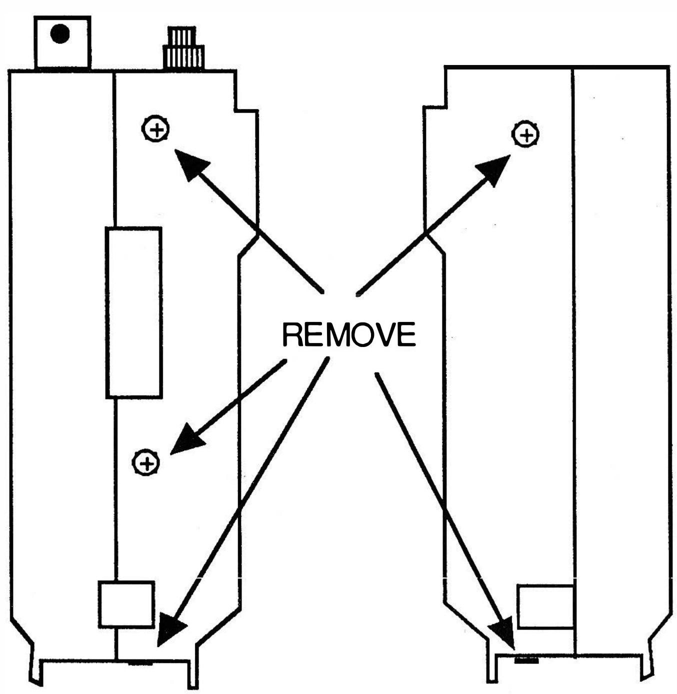


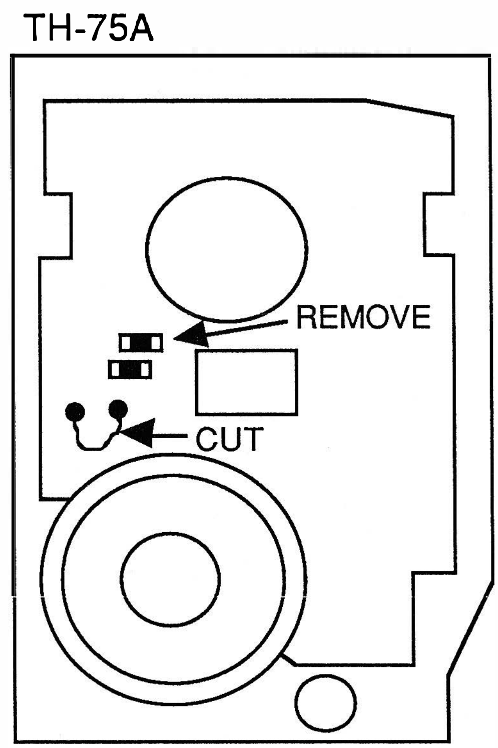
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KENWOOD TH-75A

EXPANDED RF

1 Disconnect the battery and Antenna.
2. Remove the three case screws and two battery plate screws.
3. Lift front panel from radio. Do not disconnect flex cables.
4. Cut the GREEN JUMPER WIRE, located on left side of the CPU.
5. Remove the diode. (see drawing)
6. Reassemble the radio.
7. RESET the CPU. Press and hold the M Key while turning on the Radio.



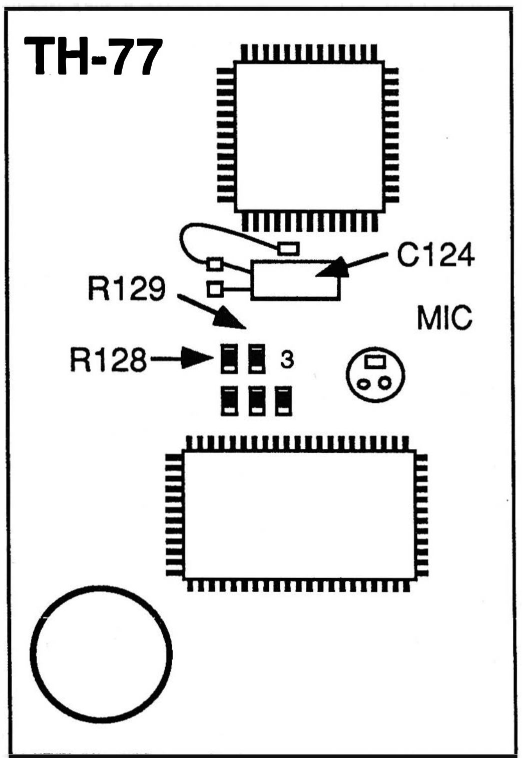


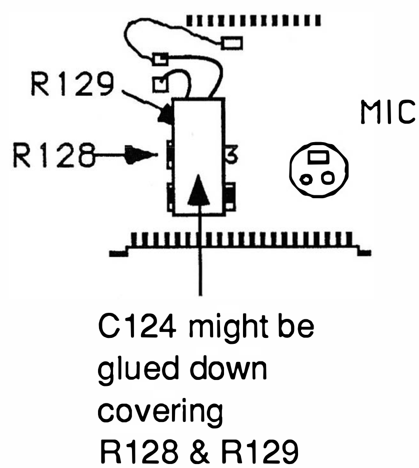
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KENWOOD TH-77A

EXPANDED RF
CROSS BAND REPEATER

1 Disconnect the battery and Antenna.
2. Remove the three case screws and two battery plate screws.
3. Lift front panel from radio. Do not disconnect flex cables.
4. Remove chip resistor R128 and R129. Capacitor C124 may be glued down over these Resistors. You may wish to unsolder the Capacitor to avoid tearing the flex board foil traces.
5. Reassemble the radio.
6. RESET the CPU.





CROSS BAND OPERATING PROCEDURES

Turn on /off the Repeater mode : Press and hold the [SUB] key and turn the power on.

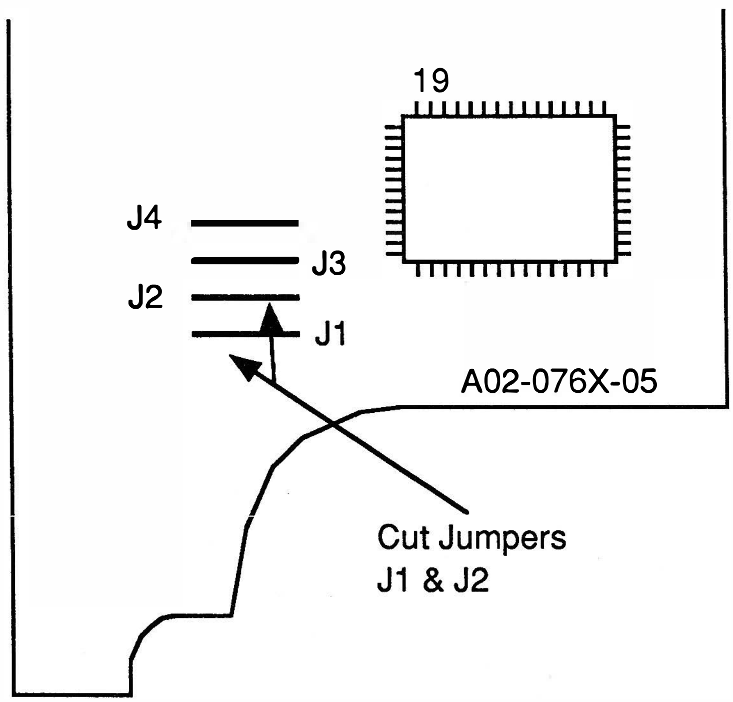
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KENWOOD TH-215

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the 4 screws from the back panel.
3. Carefully lift the front panel from the radio. Do not disconnect the flex cables.
4. CUT Jumpers J1 and J2.
5. Reassemble the radio.
6. RESET the CPU.

TH-215A/E



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KENWOOD TH-315

EXTENDED RF

1. Remove Battery and Antenna.
2. Remove the screws holding the radio together.
3. Locate the Digital Circuit board (A02-076X-05)
4. Cut Jumpers 1, 3 and 4
5. Reassemble the radio.
6. Reset the Microprocessor.

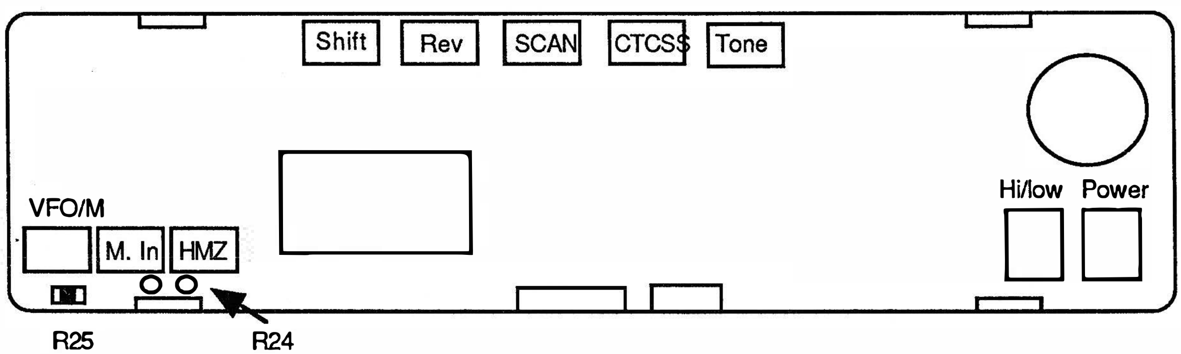
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KENWOOD TM-221

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers.
3. Locate the control unit (X53-3040-XX). It is the board closest to the Front.
4. Remove R25 and Place it in the position of R24.
5. Reassemble the radio.
6. RESET the CPU.

TM-221



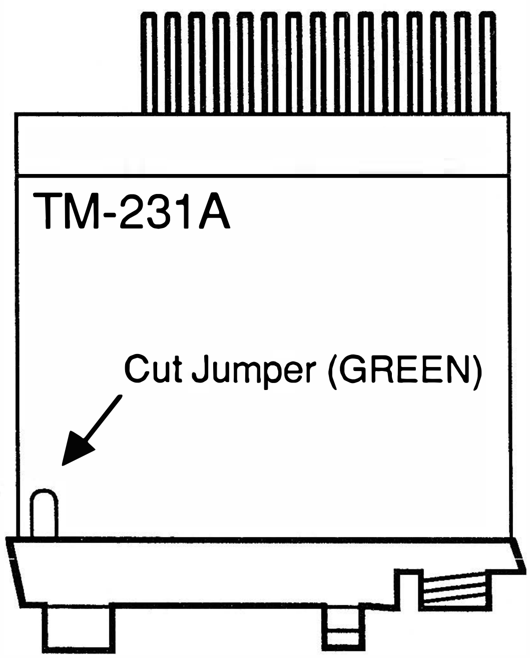
TX Range 142 MHz - 154 MHz

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KENWOOD TM-231A

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom cover.
3. Remove all Knobs from Front panel.
4. Remove the nut from the mic jack and the nut from the channel switch.
5. Remove four screws holding the front panel.
6. Remove the three screws from the control board.
7. Locate the green jumper wire sticking out the front panel, behind the VFO Button
8. Cut the green jumper and tape the edges to prevent them from shorting.
9. Install diode D209 on control board X57-3310-11.
10. Reassemble the radio
11. Reset the microprocessor (Press and hold [MR] while turning on the power)

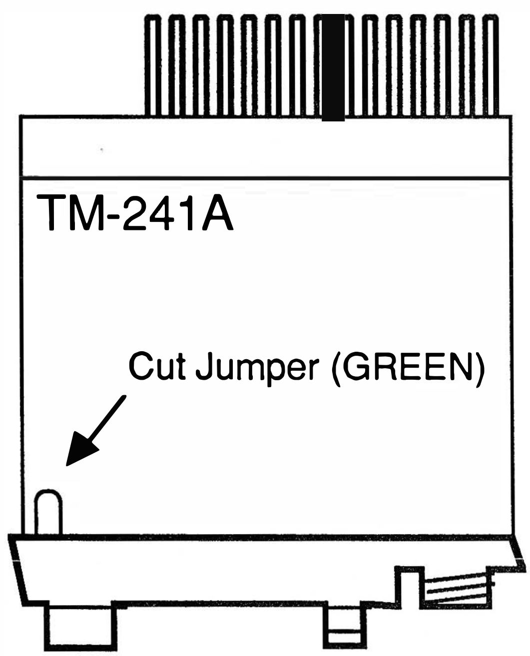


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KENWOOD TM-241A

EXPANDED RF M/C

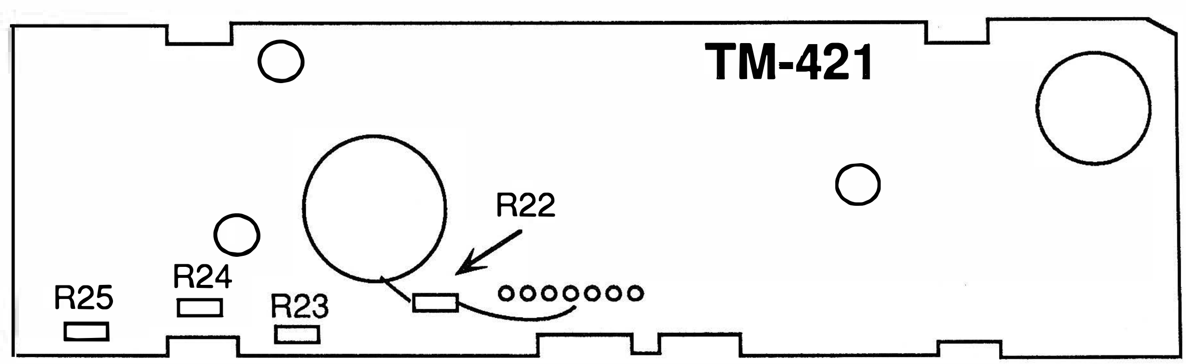
1 Disconnect the Power and antenna.
2. Remove the top and bottom cover.
3. Remove all Knobs from Front panel.
4. Remove the nut from the mic jack and the nut from the channel switch.
5. Remove four screws holding the front panel.
6. Remove the three screws from the control board.
7. Locate the green jumper wire on the control board.
8. Cut the green jumper and tape the edges to prevent them from shorting.
9. Install chip diode D209 on control board Part # MA141A
10. Reassemble the radio
11. Reset the microprocessor (Press and hold [MR] while turning on the power)



KENWOOD TM-421A

EXTENDED RF

1. Remove Power and Antenna.
2. Remove the top and bottom covers
3. Remove the Channel Knob
4. Remove the Microphone ring.
5. Remove the Volume and Squelch Knobs
6. Remove the Front panel from the UNit.
7. Remove the Front Control unit from the Chassic.
8. Locate Component side of the Control unit Circuit board.
9. Locate Chip Resistor R-25.
10. Remove R-25 and place it in the empty position R-23.
11. Remove R-22.
12. Reasemble the radio.
13. Reset the Microprocessor.



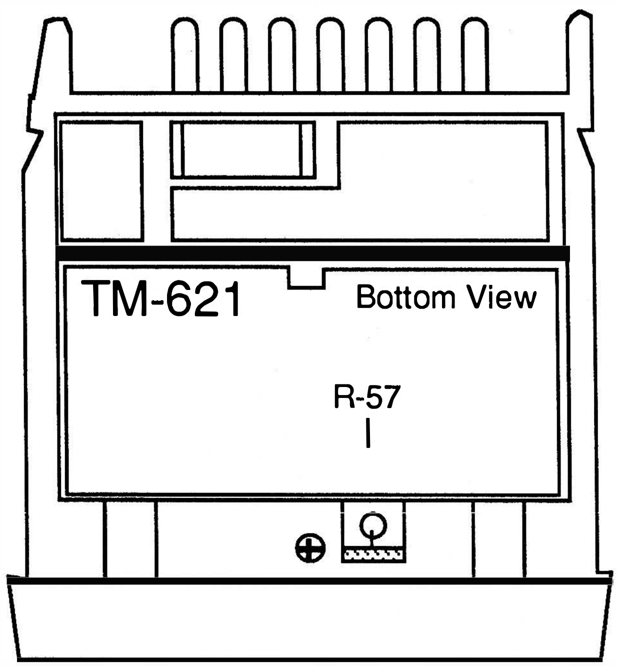
RESET : Press and hold [VFO/M] and [M.IN] and turn power on.

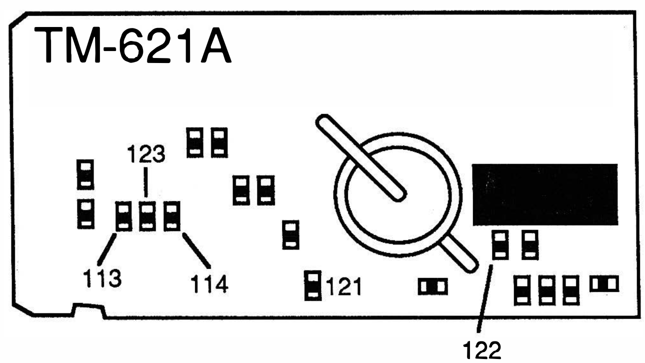
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KENWOOD TM-621A

EXPANDED RF / CROSS BAND REPEATER

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers.
3. Locate and cut R57 on Control board. (Bottom side of radio)
4. Remove the silver colored screws from the front panel.
5. Carefully pull the front panel away from the body of the transceiver.
6. Locate chip resistor R113 and R114 on the Control board. (inside front panel)
7. Remove the chip resistor located between resistors R113 & R114. It is labeled R123.
8. Remove chip resistor R121 (cross band repeater mod)
9. Remove R122 (disable 3 minute time out timer).
10. Reassemble radio.
11. Reset the microprocessor (Press and hold [F] while turning power on).





CROSS BAND OPERATING PROCEDURES

The TM-621 will receive a signal on one band and will automatically retransmit it on the other band. Each band can contain shift information.

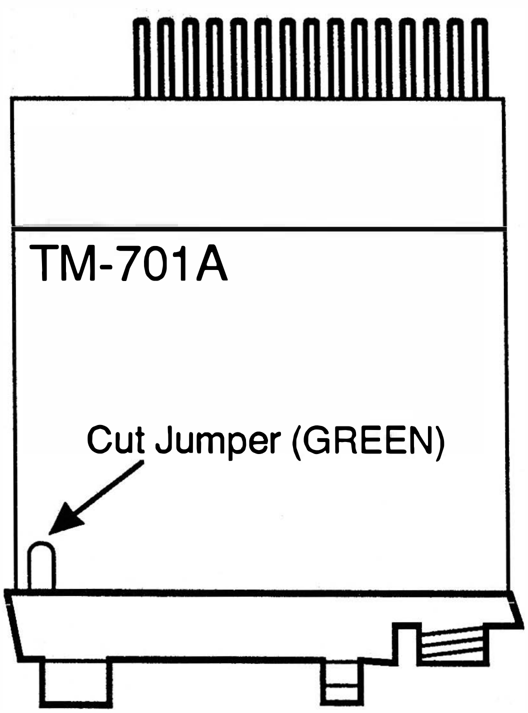
Turn on / off the Repeater mode : Press F and then press A.B.C. Key. Three dots should appear in the display when the mode is on.

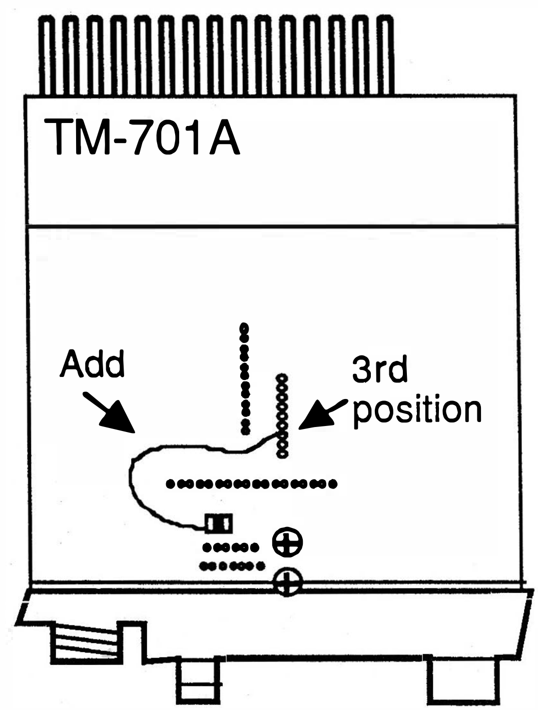
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KENWOOD TM-701A

EXPANDED RF / CROSS BAND REPEATER

1 Disconnect the Power and antenna.
2. Remove the top and bottom cover.
3. Remove Knobs from Front panel and the nuts from the Mic and Channel switch.
4. Remove 4 screws holding the front panel and the 3 screws on the control board.
5. Locate the green jumper wire sticking out the front panel, behind the VFO Button
6. Cut the green jumper and tape the edges to prevent them from shorting.
7. Optional: Install diodes D207 & D209 on control board X57-3350-00.
8. Solder a jumper to the foil side of the TX-RX board as shown in drawing.
9. Reassemble the radio
10. Reset the microprocessor (Press and hold [MR] while turning on the power)





CROSS BAND OPERATING PROCEDURES

Turn on the Repeater mode : Press and hold [F] and then press [DUP]. Then Press [F} longer than 1 Second. The F indicator will blink. Press [LOW]. Three dots should appear in the display when the mode is on.

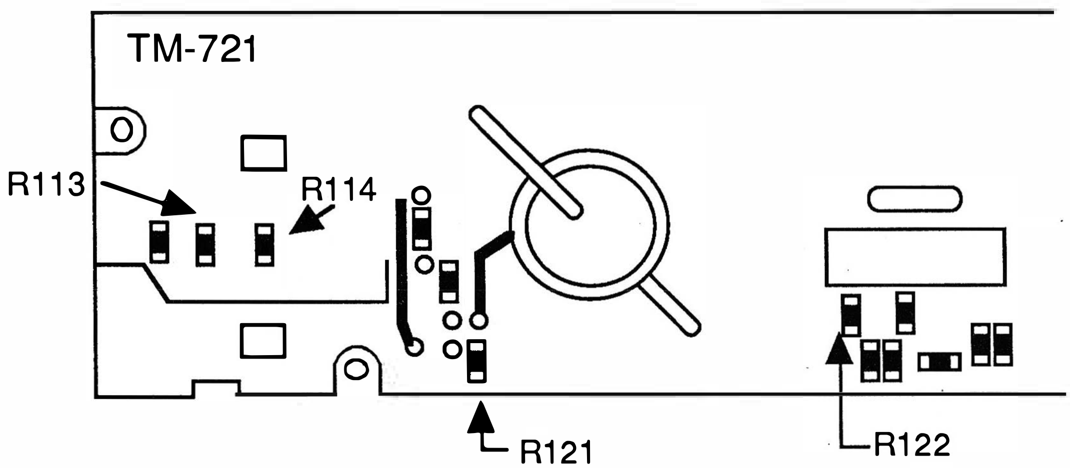
Turn off : Press [VFO].

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KENWOOD TM-721

EXPANDED RF/ CROSS BAND REPEATER

1 Remove Power, antenna and the top and bottom covers.
2. Remove the six silver screws holding the front panel to the chassis.
3. Locate R113 and R114
4. Solder a jumper between the open pads between R113 & R114
5. Remove R121. (This is the Cross band repeater mod.)
6. Remove R122. (This will override the automatic 3 minute time out timer)
7. Cut R57 from the back of the board. Do not cut R58
8. Reassemble the radio
9. Reset the Microprocessor twice. Press and Hold the MR key and turn the power switch. Do this twice.



CROSS BAND OPERATING PROCEDURES

The TM-721 will receive a signal on one band and will automatically retransmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Do not turn Tone and CTCSS on in one band.

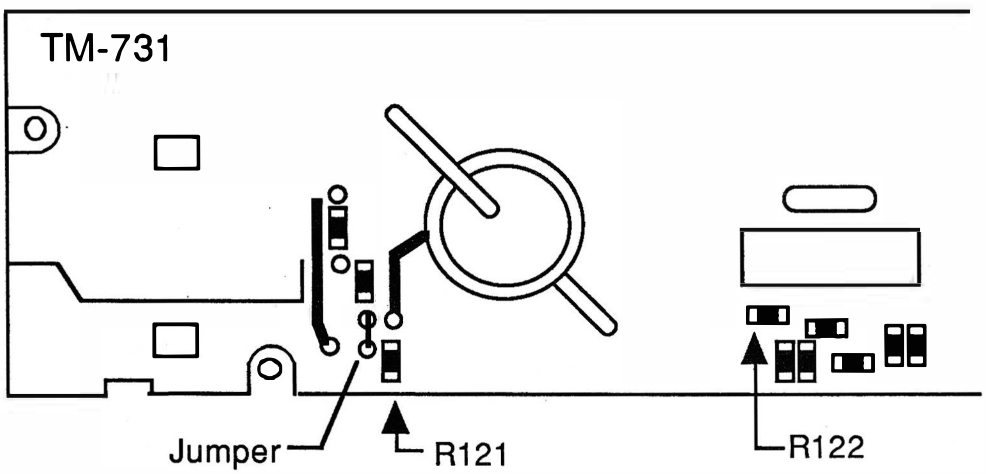
Turn on / off the Repeater mode : Press F and then press A.B.C. Key. Three dots should appear in the display when the mode is on.

CAUTION- These Modifications have not been tested. The Author, Publisher and all other parties takes NO responsibility or Liability for any damage or violation resulting from these Modifications. Performing any modification may be a Violation of FCC Rules and will void the Warranty of the radio. Use of any Modified radio may be a violation of FCC Rules. If you have any doubts, DO NOT PERFORM THIS MODIFICATION.

KENWOOD TM-731

EXPANDED RF/ CROSS BAND REPEATER/ TIME OUT TIMER

1 Remove Power and antenna and the top and bottom covers.
2. CUT RESISTOR R25. R25 is located on the Control unit on the bottom side of the Radio. The resistor can be seen by looking through the cutout of the chassis just behind the front panel
3. Remove silver color screws from the front chassis. The screws are located 2 on each side, 1 on the top and 1 on the bottom.
4. Pull the front panel away from the radio. Do not unplug any cables.
5. Install **a** jumper wire as shown in diagram 1.
6. Remove R121. (This is the Cross band repeater mod.)
7. Remove R122. (this will override the automatic 3 minute time out timer)
8. Reassemble the radio
9. Reset the Microprocessor twice. Press and Hold the MR key and turn the power switch. Do this twice.



CROSS BAND OPERATING PROCEDURES

The TM-731 will receive a signal on one band and will automatically retransmit it on the other band. Each band can contain shift information. Only one band may contain PL encode/decode information. Do not turn Tone and CTCSS on in one band.

Turn on / off the Repeater mode : Press F and then press A.B.C. Key. Three dots should appear in the display when the mode is on.

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KENWOOD TM-2530/2550/2570

EXPANDED RF

1 Disconnect the Power and antenna.
2. Remove the bottom case .
3. Locate the Control Unit on the bottom of the radio. This is the same board the TU-7 & MU-1 are mounted on.
4. CUT diodes D8 & D11 & D12. They are located to the left of IC3.
5. Reassemble the radio.
6. RESET the CPU. Press and hold the [PS] Key while turning on the Radio.

Frequency increases to 150.995 MHz

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KENWOOD TR-751

EXPANDED RF M/C

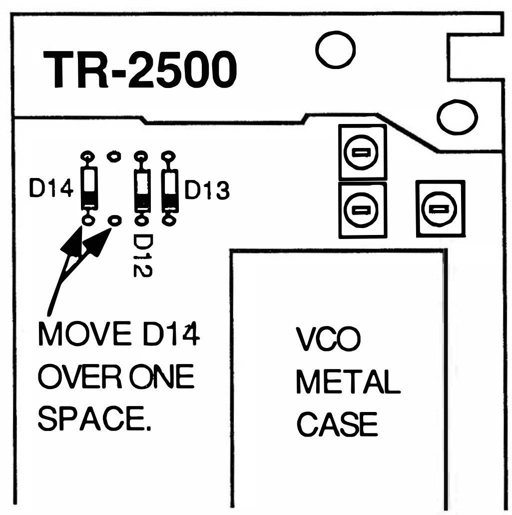
1 Disconnect the Power and antenna.
2. Remove the case .
3. Locate the Control Unit on the radio.
4. CUT diodes D1. They are located to the left of IC3.
5. Reassemble the radio.
6. RESET the CPU.

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KENWOOD TR-2500

EXPANDED RF M/C

1 Disconnect the Battery and antenna.
2. Remove the 3 screws holding on the back cover.
3. Remove the 2 screwson the bottom of the radio.
4. Unsolder the tabs of the lithium battery.
5. Unsolder Diode D14.
6. Install the diode in the location next to D12.
7. Reinstall the lithium battery.
8. Reasemble the radio.



Range : 141.000 MHz to 151.000 MHz

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KENWOOD TR-2600

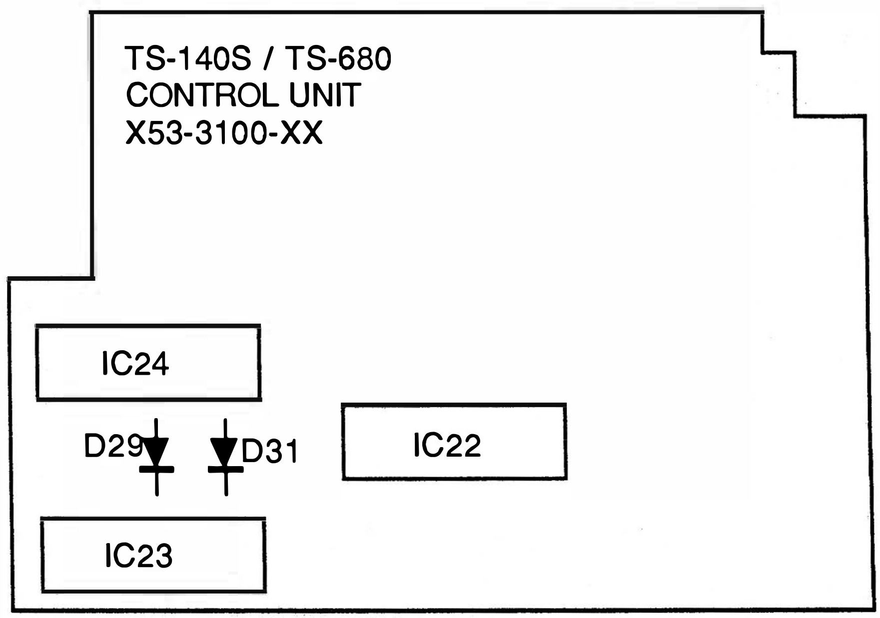
EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the screws and open the radio.
3. Remove Diodes D32 & D33. They are located on the RX unit (x%%-1380-XX)
4. Press the RESET Switch
5. Reassemble the radio.

KENWOOD TS-140S

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate the Control board on the bottom of the TS-140S
4. Remove Diode D31 on the Control board.
5. Reassemble the radio.
6. RESET the CPU.



Auxiliary Function:

1. Put radio in VFO mode nad turn power off.
2. Press and hold [VFO/M] & [LSB/USB] and tuen power on.

The display will say " -HELLO-"
The CW announcement will please you.

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KENWOOD TS-430S

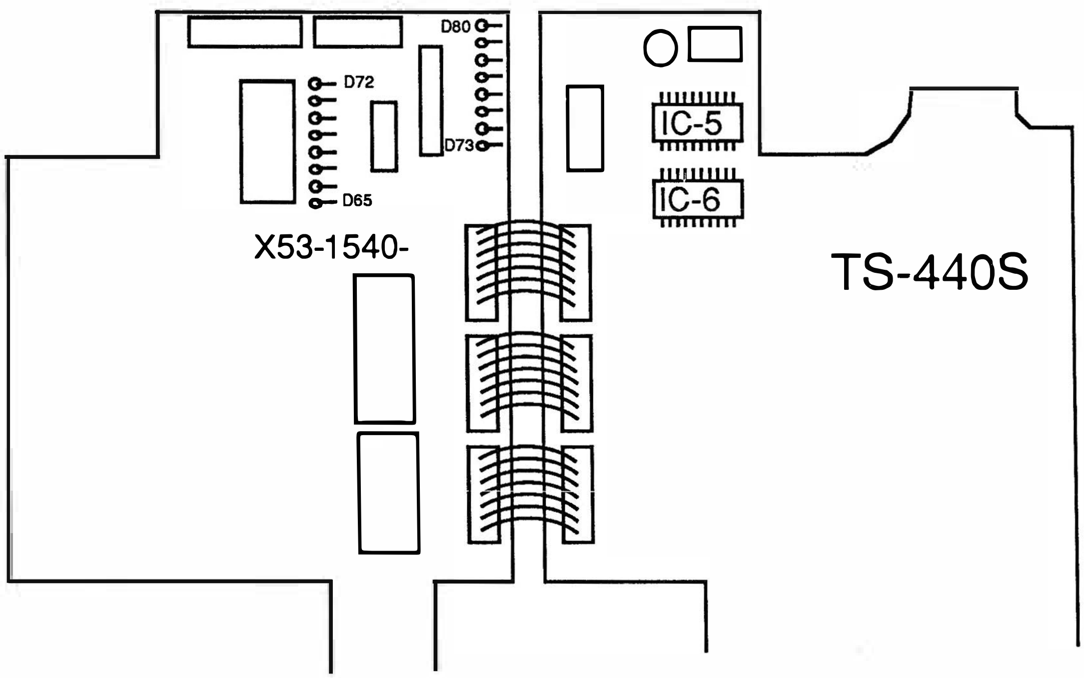
EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate Connector # 10 on the RF circuit board
4. Cut the two wires that are NOT GREEN. Leave the Green Wire.
5. Wrap Tape around the ends of the cut wires
6. Reassemble the radio.
7. RESET the CPU.

KENWOOD TS-440S

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Remove the Countersunk screws that secure the front panel to the chassis. There are two on each side
4. Gently pull the front panel forwards.
5. Remove the 5 small round head screws that secure the shield plate to the front panel. There are 2 on top and 3 on the bottom.
6. Remove Diode D80. D80 is located in the corner near Connector 54.
7. Cut Diode 66 for 10 Hz resolution. See page 24 of the instruction manual.
8. Reassemble the radio.
9. RESET the CPU.



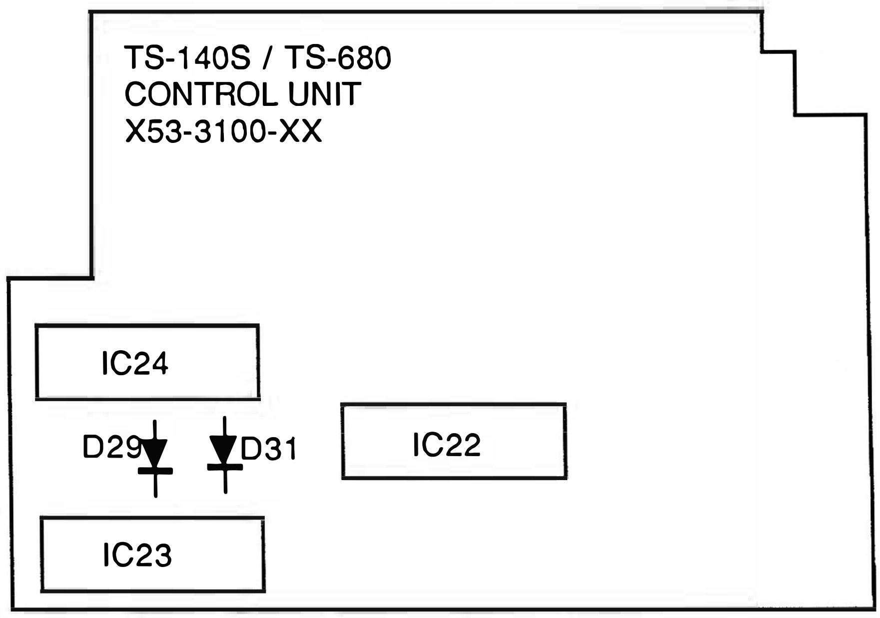
RESET CPU: Press and hold [A=B] and turn power on.

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KENWOOD TS-680

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Locate the Control board on the bottom of the TS-140S
4. Remove Diode D31 on the Control board.
5. Reassemble the radio.
6. RESET the CPU.



Auxiliary Function:

1. Put radio in VFO mode nad turn power off.
2. Press and hold [VFO/M] & [LSB/USB] and tuen power on.

The display will say " -HELLO-"
The CW announcement will please you.

KENWOOD TS-711

EXPANDED RF

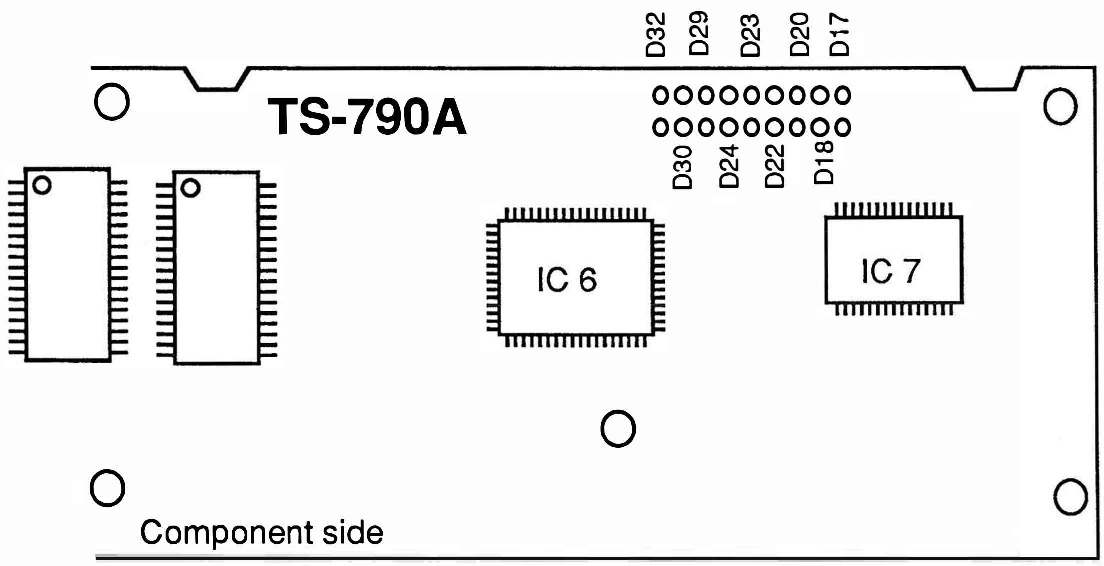
1 Disconnect the Power and antenna.
2. Remove the covers.
4. REMOVE D30
5. Reassemble the radio.
6. RESET the CPU.

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KENWOOD TS-790A

EXPANDED RF

1. Disconnect the Power and antenna.
2. Remove the top cover.
3. Locate circuit board positioned vertically behind the front panel.
4. Locate and remove diodes 29 & 30.
5. Reassemble radio
6. Reset the microprocessor. (Press and hold [A=B] and turn power on)



Note: Factory diode set-up: IN-D22,29,30,32
IN but clipped by factory-D23,24
Empty position=D17,18,20

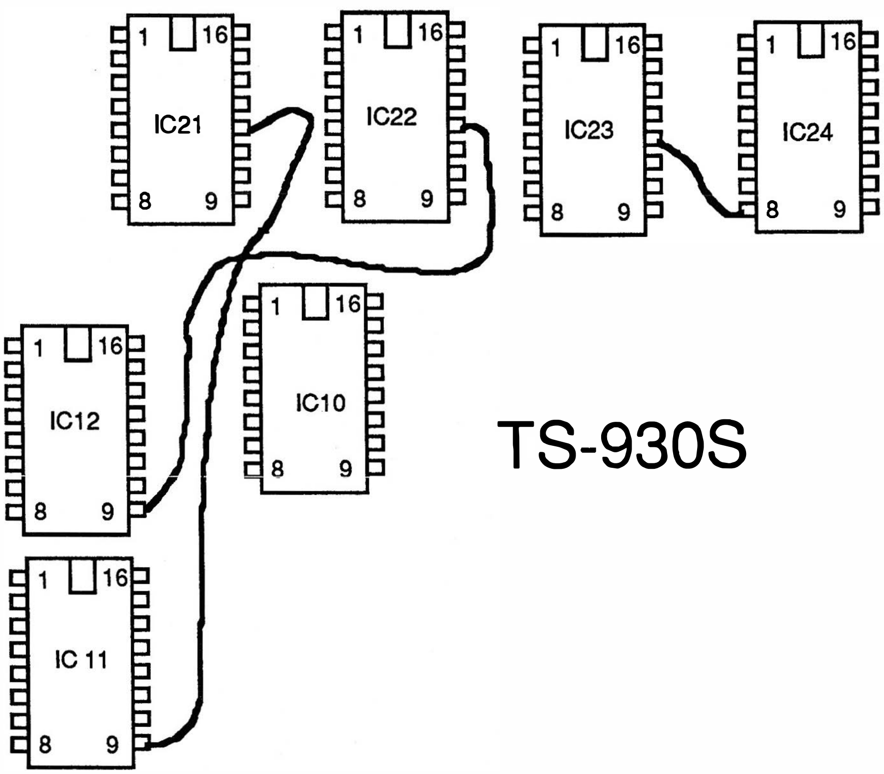
RANGE: 130-170 MHz & 422.2-463 MHz

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KENWOOD TS-930S

EXPANDED RF M/C

1 Disconnect the Power and antenna.
2. Remove the top and bottom covers from the radio.
3. Remove the four screws from the speaker mounting and the top panel Assembly.
4. Swing the assembly away and unplug the Red/Black battery leads from the Digital unit X54-1680-00.
5. Solder wires between the following locations:
   IC21 Pin 12 to IC11 Pin 9
   IC22 Pin 12 to IC12 Pin 9
   IC23 Pin 12 to IC24 Pin 8
   Tack-solder on the component side of the board is OK
5. Reassemble the radio.



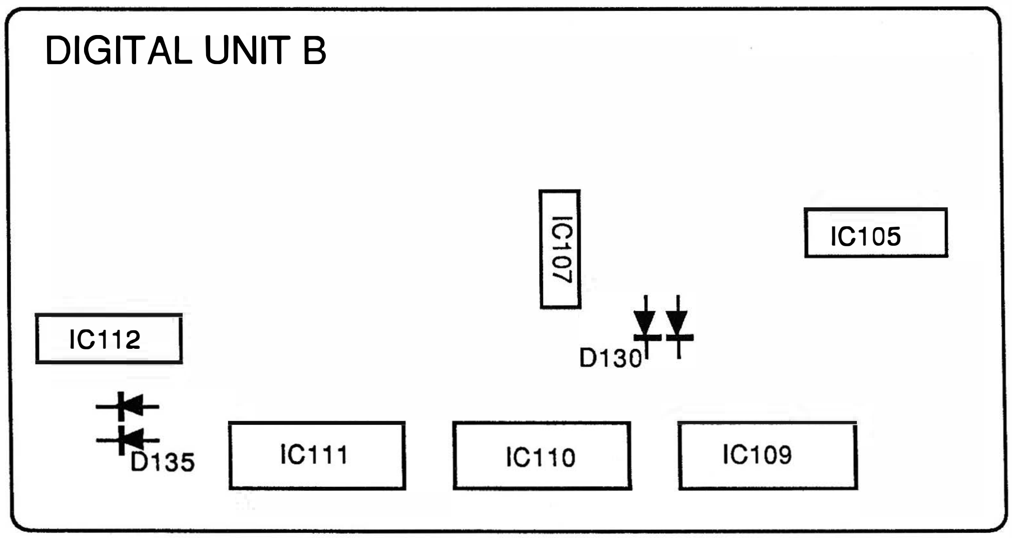
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KENWOOD TS-940

EXPANDED RF

1 Disconnect the Power and antenna.
2. Remove case screws and case.
3. Locate Digital Unit B. This is the board that is in the enclosure where the VS-1 is mounted. Digital Unit B is the board closest to the Front Panel.
4. Cut Diodes D130 & D135. Located near IC-109.
5. Reassemble the radio
6. Turn the radio on, Press and Hold the [A=B] Switch and turn off and back on the radio.

TS-940



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KENWOOD TS-950SD

EXTENDED RF

1. Remove Power and Antenna.
2. Remove the top and bottom covers
3. Locate the Digital Unit.
4. Cut Diode D-17
5. Reassemble the Radio
6. Reset the Microprocessor.

RESET: Press and hold [A=B] and turn power on.

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KENWOOD TS-2400

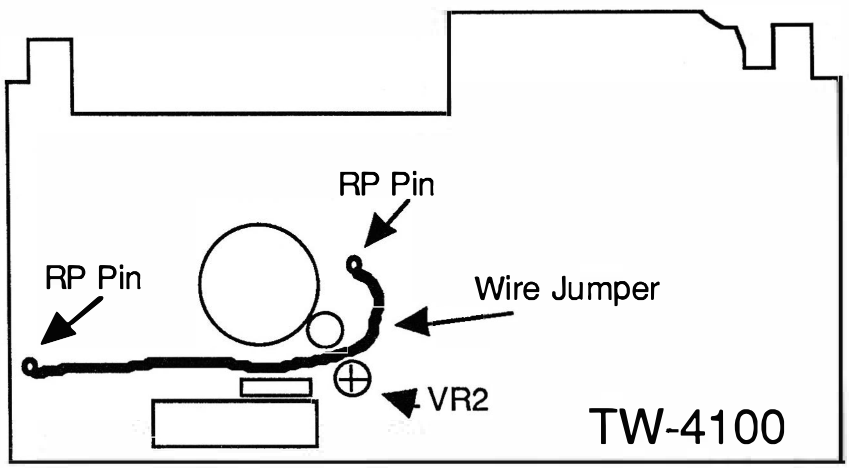
EXTENDED RF

1. Remove Power and Antenna.
2. Open the radio.
3. Locate the RX Circuit board.
4. Locate and cut Diodes D32 and D33. (Located near the DTMF IC)
5. Reassemble the radio.
6. Reset the Microprocessor.

KENWOOD TW-4100

REPEATER MOD

1. Remove Power and Antenna.
2. Remove 4 screws securing the top cover.
3. Remove 10 screws securing the bottom cover.
4. Solder a wire jumper connecting the two RP Pins. (see drawing)
5. Reassemble radio



CROSS BAND REPEATER PROCEDURES

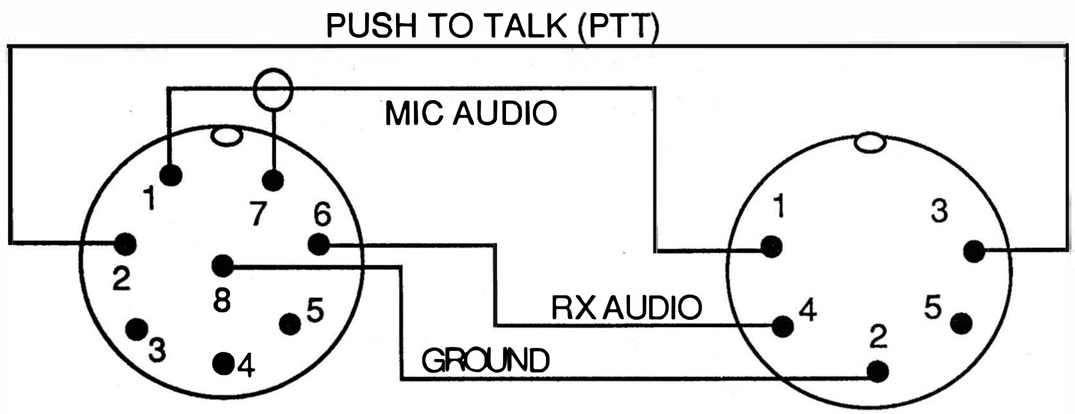
The VFO and a Memory channel (except 8 & 9) must be used. Select the proper frequencies, offsets & tone. (VFO simplex operation must use DUP with a 0 offset.)

TURN ON - Enter frequencies in a memory and VFO and press [Shift]. Turn power off. Press and hold [REV] and turn radio on.
TURN OFF - Turn Power off.

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KENWOOD TM SERIES

TNC-2 HOOKUP



Kenwood TM SERIES

TNC-2 OR CLONE

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Radio / Tech Modifications

ICOM Radio Modifications

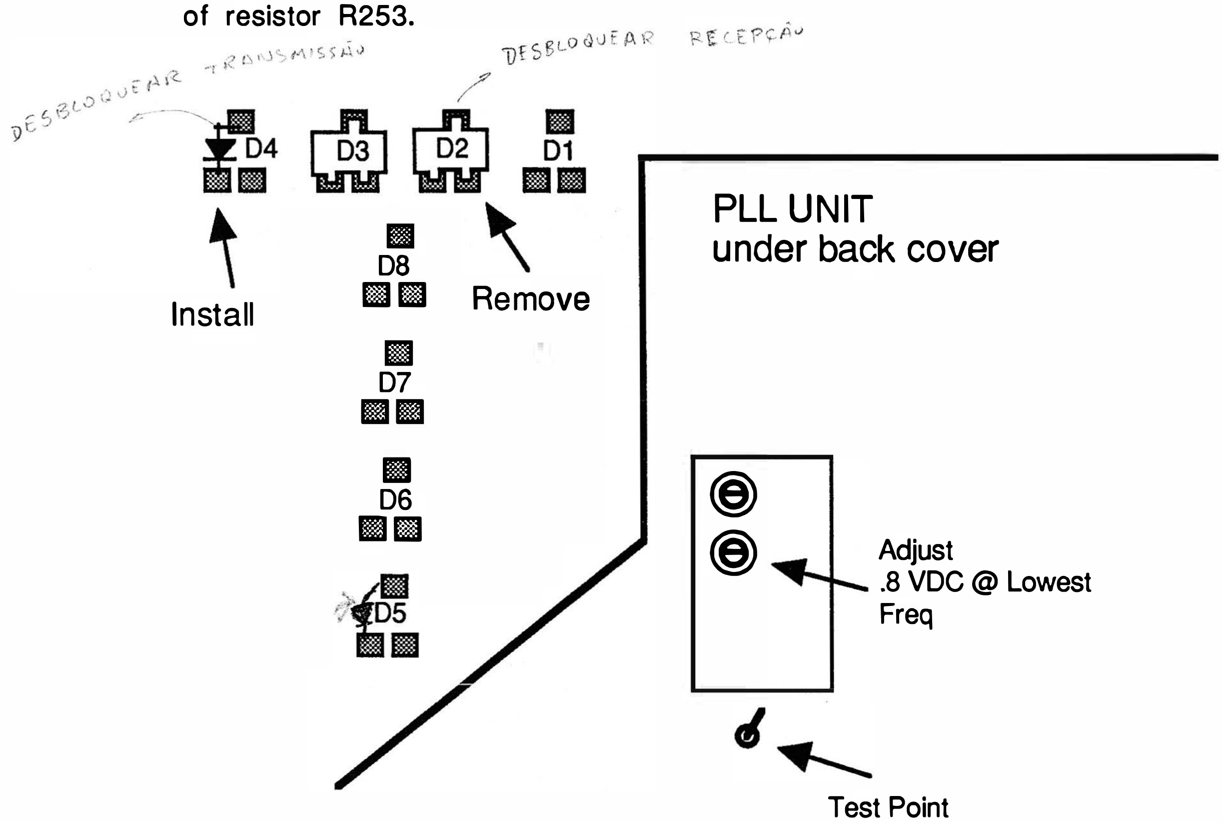
ICOM

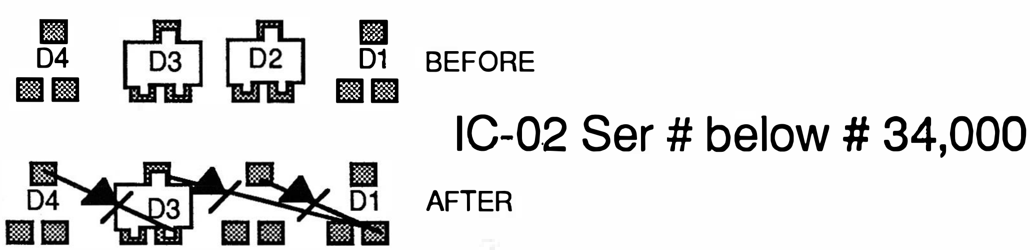
ICOM IC-02AT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove screws open case.
3. Locate and remove chip diode D2 on Logic unit.
4. On 02's with ser # over 34,000 - Install a diode across pads of diode D4 (see drawing) 1N4148 or 1SS211
5. On serial #'s below 34,000 install three diodes. (see drawing)
6. Reassemble radio

Note Adjust VCO for .8 VDC at lowest desired Freq. Measure at VCO test point, tip of resistor R253.



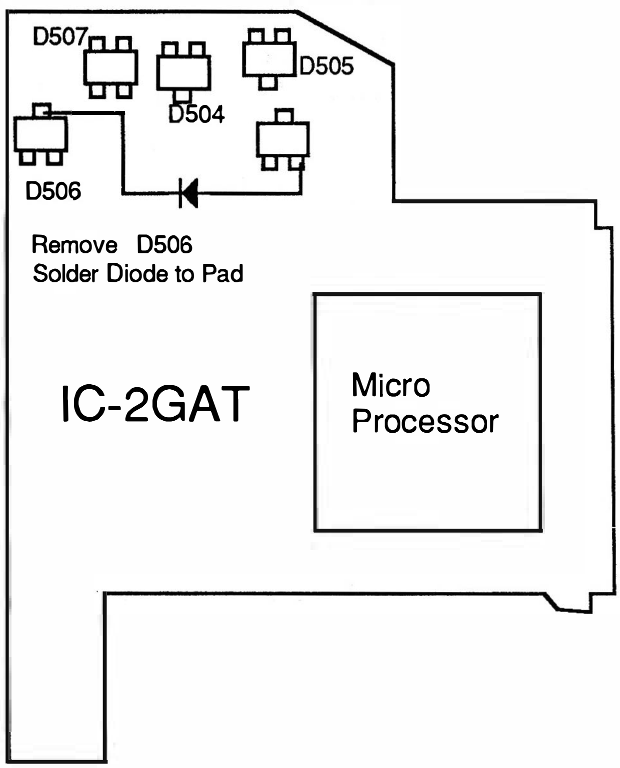


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ICOM IC-2GAT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove Screws and open radio
3. Remove D506 (this part is already removed on US version)
4. Attach Diode as shown (Use 1N914 or equivalent Diode)
   Make sure Diode leads will not short anything. Cover them in tape.
5. Reassemble Radio
6. Reset Radio. See Page 26 of user manual.

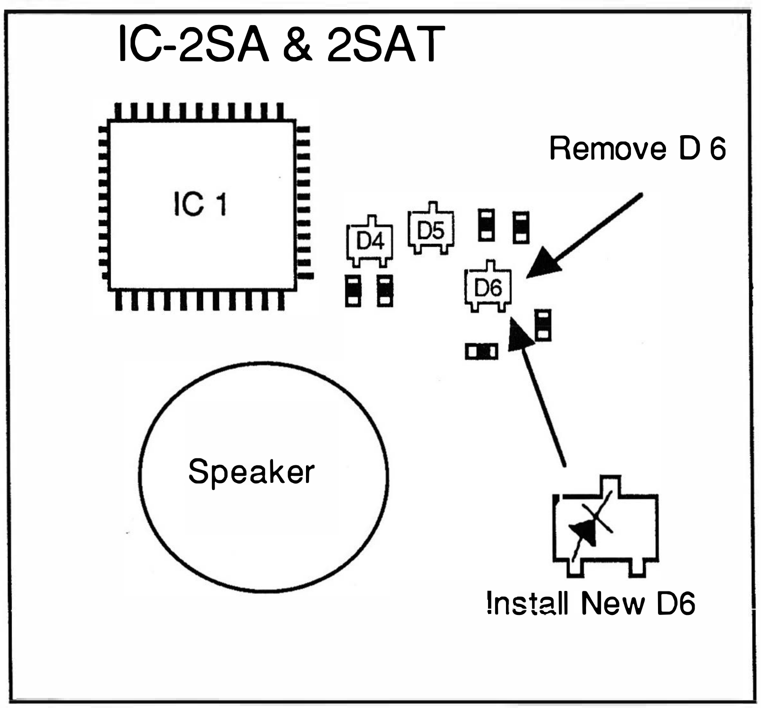


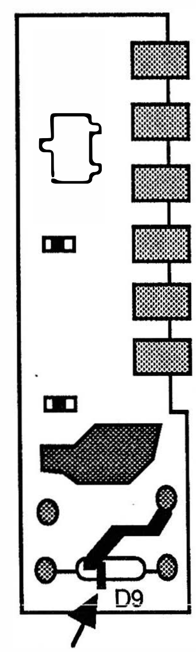
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ICOM IC-2SA, 2SAT & 3SAT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove Screws and open radio.
3. Locate and remove diode D9 on COLGC A unit (Already removed on USA version)
4. Remove chip diode D6. (Already removed on USA version)
5. Solder install a chip diode (DA114) in place of D6 position.
   A 1N4148 or other diode can be used if extreme caution is taken.
6. Reassemble radio
7. Reset Microprocessor. (2SAT: Press & hold [#], [B] & Light, Turn power on)
   (2SA: Press & hold [FUNC],[CALL] & Light, Turn power on)





Remove D 9

2SAT Range RX 108-140 AM, 138-169 FM, 310-370 FM TX 139 - 163 FM

Optional Commands: Push [LAMP] & [Keyboard Key, see below] and Power on.
[1] Enter 4 digits, [2] Enter 5 digits, [3] Enter 6 digits,
[4] Pause Scan, [5] to see timer scan, [7] PS off
[8] PS 1:4 125 msec on/500msec off, [9] PS 1:16
[0] PTT Disable, [*] PTT Enable, [#] PTT Disable
[A] Reset, [D] Display Test

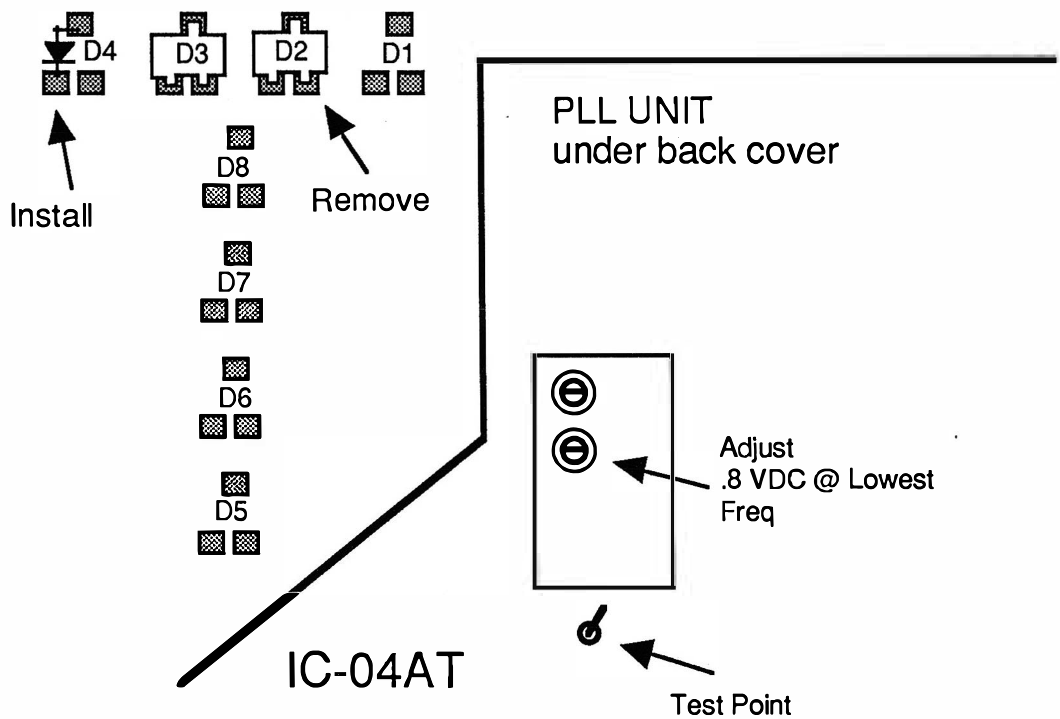
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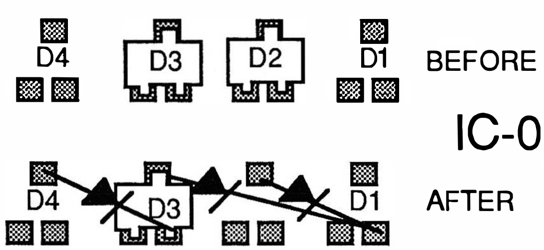
ICOM IC-04AT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove screws open case.
3. Locate and remove chip diode D2 on Logic unit.
4. On 02's with ser # over 34,000 - Install a diode across pads of diode D4 (see drawing) 1N4148 or 1SS211
5. On serial #'s below 34,000 install three diodes. (see drawing)
6. Reassemble radio

Note Adjust VCO for .8 VDC at lowest desired Freq. Measure at VCO test point.





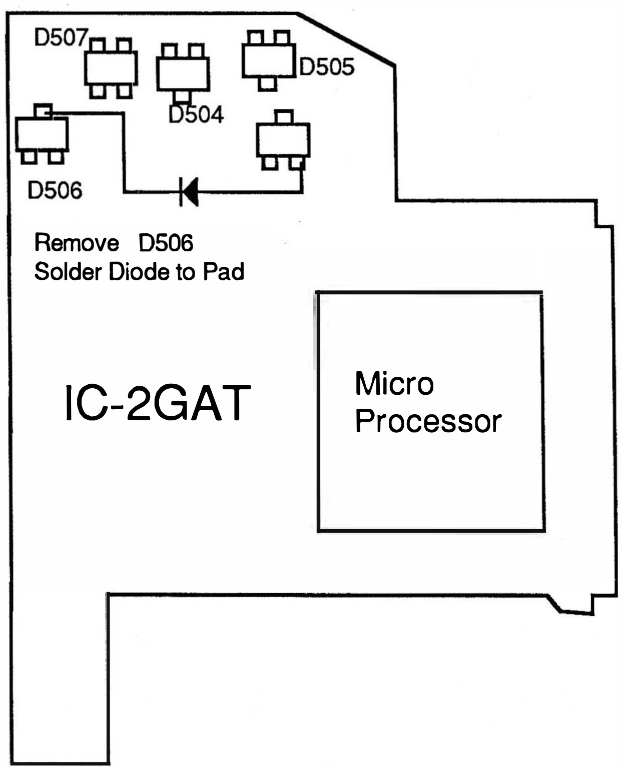
IC-02 Ser # below # 34,000

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ICOM IC-4GAT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove Screws and open radio
3. Remove D506 (this part is already removed on US version)
4. Attach Diode as shown (Use 1N914 or equivalent Diode)
   Make sure Diode leads will not short anything. Cover them in tape.
5. Reassemble Radio
6. Reset Radio. See Page 26 of user manual.

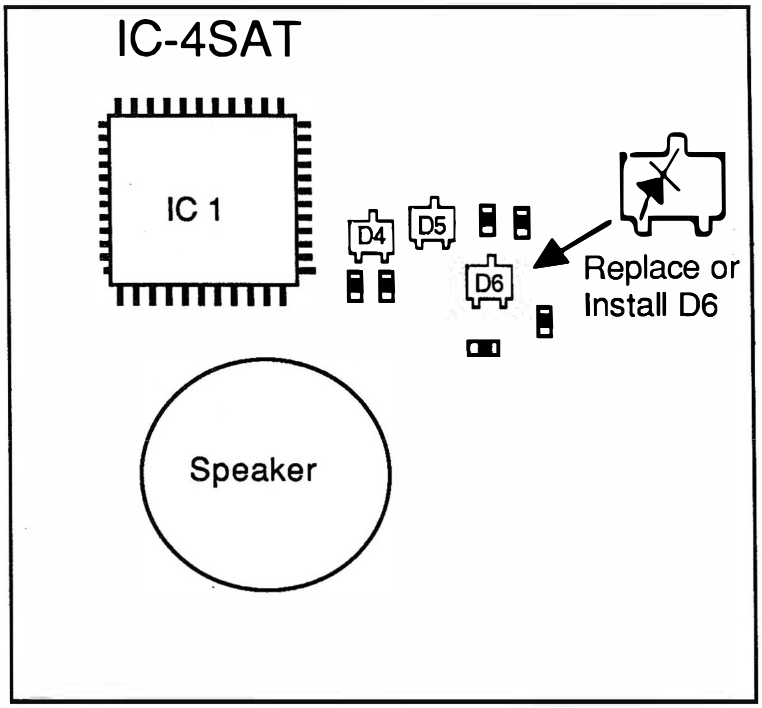


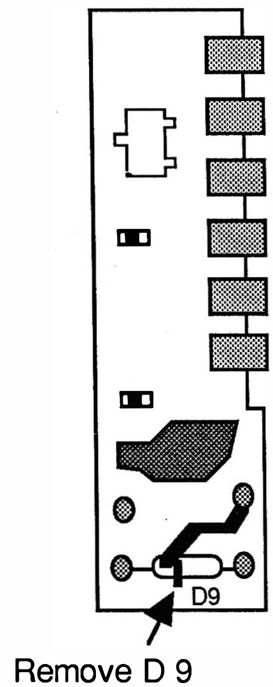
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ICOM IC-4SAT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove Screws and open radio.
3. Locate and remove diode D9 on COLGC A unit (See Drawing)
4. Solder install a chip diode (DA114 T107) in position D6.
   A 1N4148 or other diode can be used if extreme caution is taken.
5. Reassemble radio





4SAT Range 435 MHz - 465 MHz. (any 30 Meg Segment from 400-490)

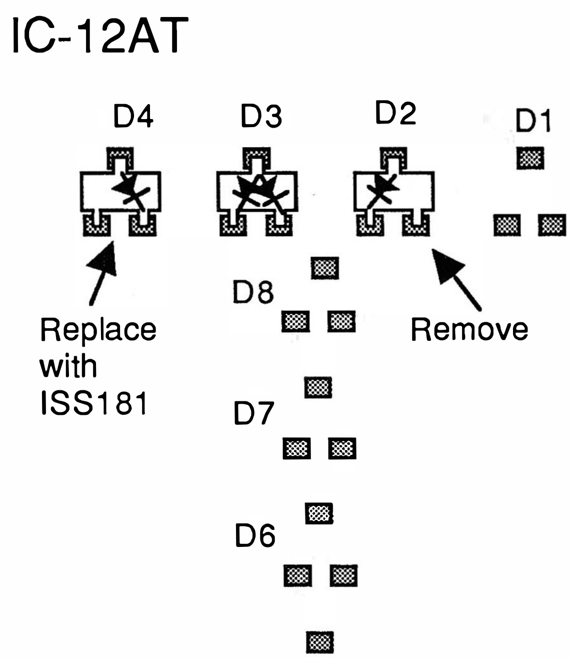
Optional Commands: Push [LAMP] & [Keyboard Key, see below] and Power on.
[1] Enter 4 digits, [2] Enter 5 digits, [3] Enter 6 digits,
[4] Pause Scan, [5] to see timer scan, [7] PS off
[8] PS 1:4 125 msec on/500msec off, [9] PS 1:16
[0] PTT Disable, [*] PTT Enable, [#] PTT Disable
[A] Reset, [D] Display Test

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ICOM IC-12AT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove Screws and open radio.
3. Locate and remove diode D2 (See Drawing)
4. Replace diode D4 with ISS 181 (A3)
5. Reassemble radio

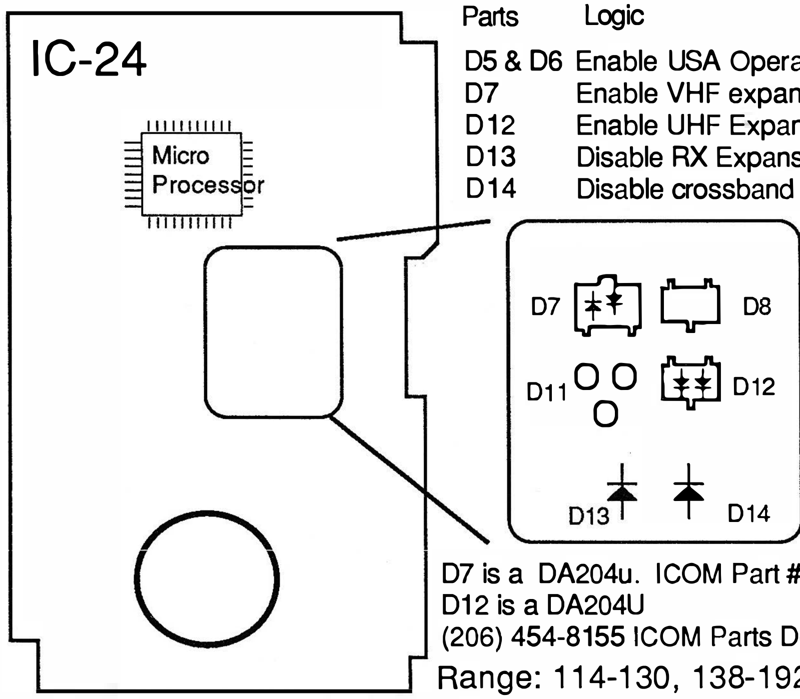


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ICOM IC-24

EXPANDED RF/ Crossband Repeater

1. Remove Battery and Antenna
2. Remove Screws and open radio
3. Remove Diode D8.
4. Remove Diode D14 (Crossband Repeater)
5. Remove Diode D13 (Expanded RX)
6. Attach Diode DA204u to position D7
7. Attach Diode DA202u to position D12. Note some models require a DA204u.
8. Reassemble Radio
9. Press and hold [light] & [B] & [#] and turn power on.
   Note: Press and hold [light] & [3] and turn power on for direct Freq entry.
   [light] & [2] will reset the radio for 10MHz input operation.



Parts	Logic
D5 & D6	Enable USA Operation
D7	Enable VHF expansion
D12	Enable UHF Expansion
D13	Disable RX Expansion
D14	Disable crossband RPTR.

D7 is a DA204u. ICOM Part # 912-06015
D12 is a DA204U
(206) 454-8155 ICOM Parts Dept.

Range: 114-130, 138-192, 403-485 & 825-903

CROSS BAND REPEATER PROCEDURES (VFO MODES ONLY)

TURN ON - HOLD [FUNCTION] & PRESS [C] THEN [5] THEN [D]
TURN OFF - HOLD [FUNCTION] & PRESS [D]

Note: When Transmitting in the 825-900MHz range, the unit is simultaneously transmitting in the 400-450MHz band!!

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ICOM IC-28A & H

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and cut Diode D21 inside the top of the circuit board.
4. Reset the Microprocessor
5. Reassemble the radio

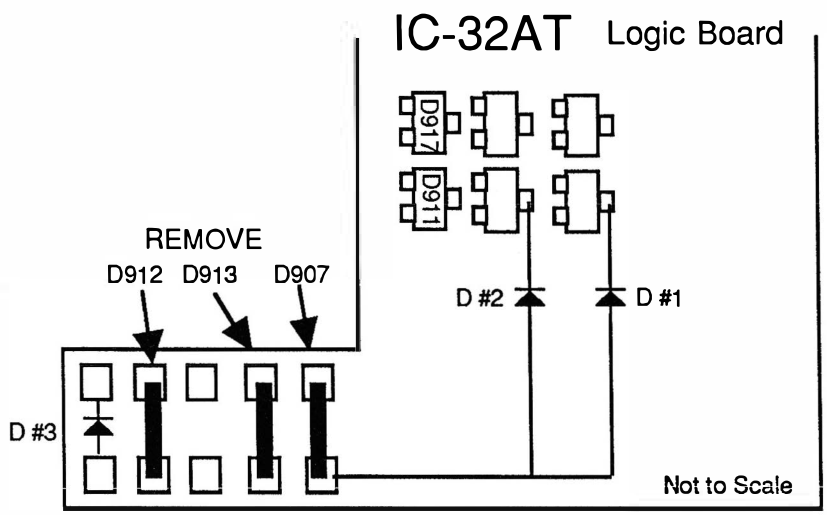
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ICOM IC-32AT

EXPANDED RF / CROSS BAND REPEATER/ 10 MHZ ENTRY

1. Remove Battery and Antenna.
2. Remove Screws and open radio.
3. Remove D907 (150MHz+) (this part is already removed on US version)
4. Add Diode #1 (1N914).
5. Remove D913 (450MHz+).
6. Add Diode #2 (1N914).
7. Add diode #3 (1N914) 10 MHZ.
8. Remove D912 (Repeater mod).
9. Reset Microprocessor.
10. Reassemble radio.

Adjust C-510 to get .25 volts at UHF test point at lowest desired frequency. C-510 is located in metal box. The test point is located next to the metal box.



CROSS BAND REPEATER PROCEDURES (Simplex Freqs only)

TURN ON - Press & Hold [Function], Press [C} key, Press [6] key, Press [D] key. Release Function key.

TURN OFF - Press and Hold [Function], Press [D] key, Press [C] key. Release [Function]

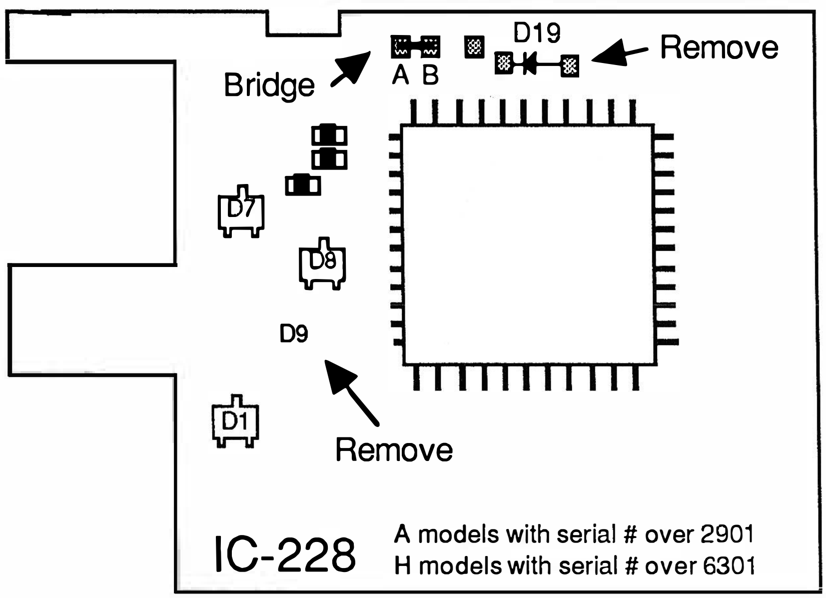
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ICOM IC-228A

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Remove diode D19
4. Remove chip diode D9
5. Solder bridge Pads A & B
6. Reassemble radio
7. Reset microprocessor (Push and hold [VFO/M] & [Mic/DN] and turn power on.

Note : Discriminator output on pin 9 of IC 1 (MC3357P)



On earlier serial #'s Remove D19 and replace with a 1SS193.
If there is already a diode in D7 replace it with a 1SS184.

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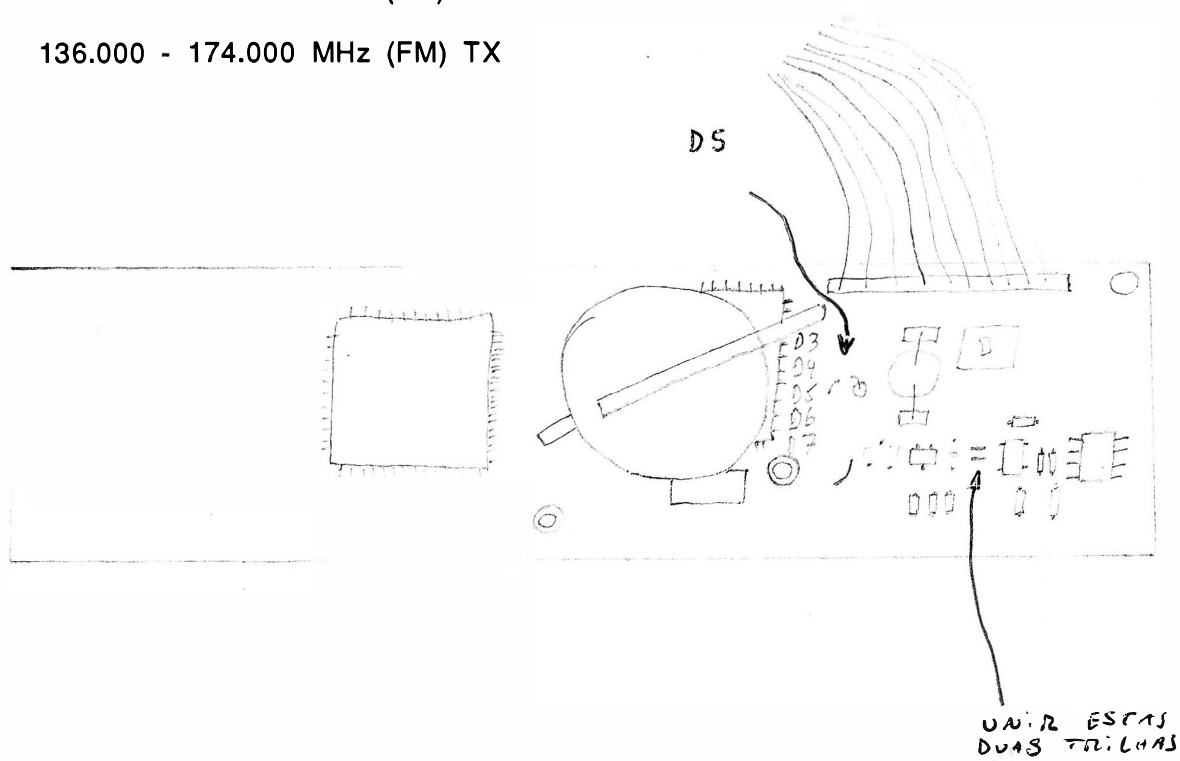
ICOM IC-229

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and cut Diode D5 on the LOGIC board
4. Install a jumper at "land" point.
5. Reassemble radio
6. Reset microprocessor. (LIGAR O RADIO MANTENDO APERTADOS OS KNOBS "SET" e "MW". TODO O DISPLAY ASCENDERÁ POR 2 SEG.)

FREQ 118.000 - 135.995 MHz (AM) RX
136.000 - 174.000 MHz (FM) RX

136.000 - 174.000 MHz (FM) TX



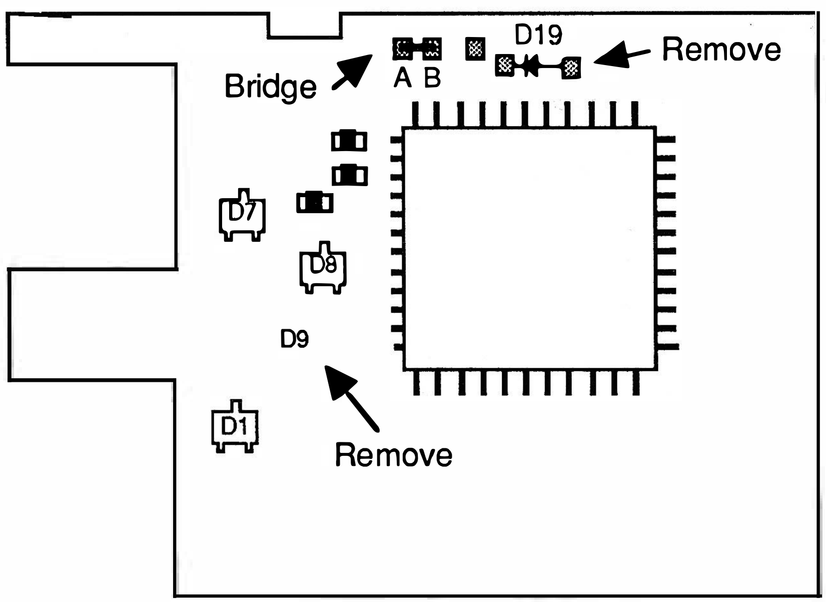
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ICOM IC-448A

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Remove diode D19
4. Remove chip diode D9
5. Solder bridge Pads A & B
6. Install Diode D7. (part # 1SS193)
7. Reassemble radio
8. Reset microprocessor (Push and hold [VFO/M] & [Mic/DN] and turn power on.

Note : Discriminator output on pin 9 of IC 1 (MC3357P)

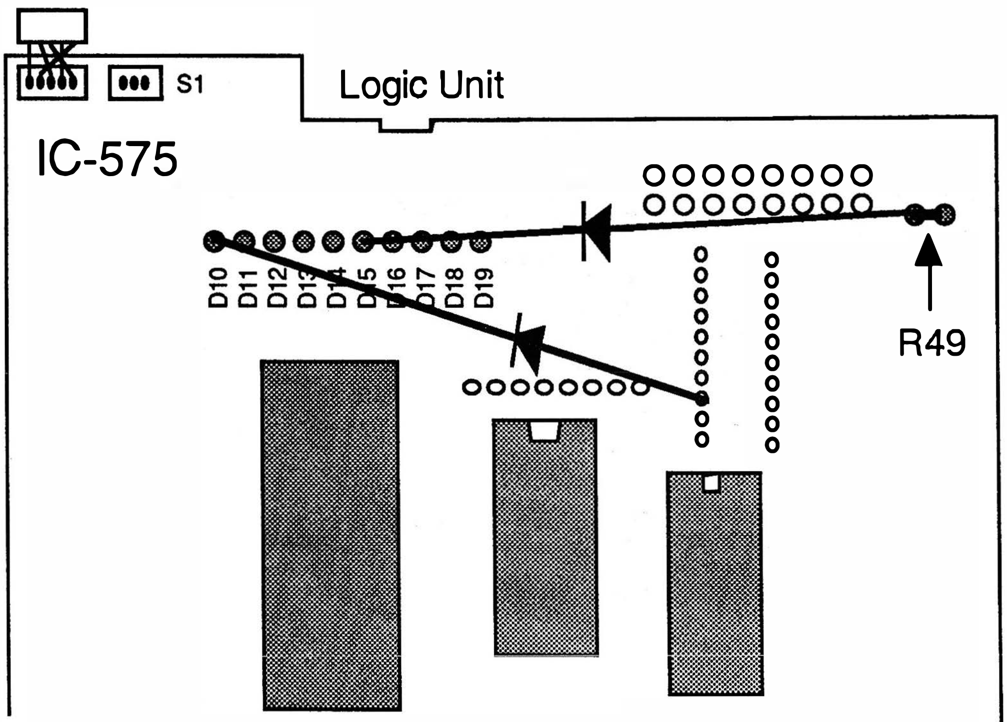


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ICOM IC-575

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate the Logic Unit
4. Attach two diodes as shown. (any standard diode)
   D10 to 3rd pin & R49 to D15
5. Reassemble radio.



Range	RX	26 - 56 MHz
	TX	26 - 56 MHz

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ICOM IC-720A
EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate main board and cut light blue wire, pin 1 of plug K-10
4. Reset the Microprocessor.
5. Reassemble the radio

ICOM IC-725A
EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate PLL board and cut Diode D5.
4. Reset the Microprocessor.
5. Reassemble the radio

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ICOM IC-730

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate R F board.
4. Cut green wire(labeled 'D')
5. Cut Resistor R-48
6. Reset the Microprocessor.
7. Reassemble the radio

ICOM IC-735

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws and open top cover.
3. Locate Diodes D33 and D34 on the top of the PLL circuit board.
4. Cut the Teflon covered leads of Diodes D33 and D34.
5. Reassemble the radio

Note: Accessing the main Board may require taking out many of the other components of the radio.

ICOM IC-740

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate RF board.
4. Cut (white resistor) jumper located between D31 and 'C' wire.
5. Reset the Microprocessor.
6. Reassemble the radio

ICOM IC-745

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate RF board on the side of the radio.
4. Cut the light brown wire on J7 Pin 1.
5. Reassemble the radio.

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ICOM IC-751

EXPANDED RF

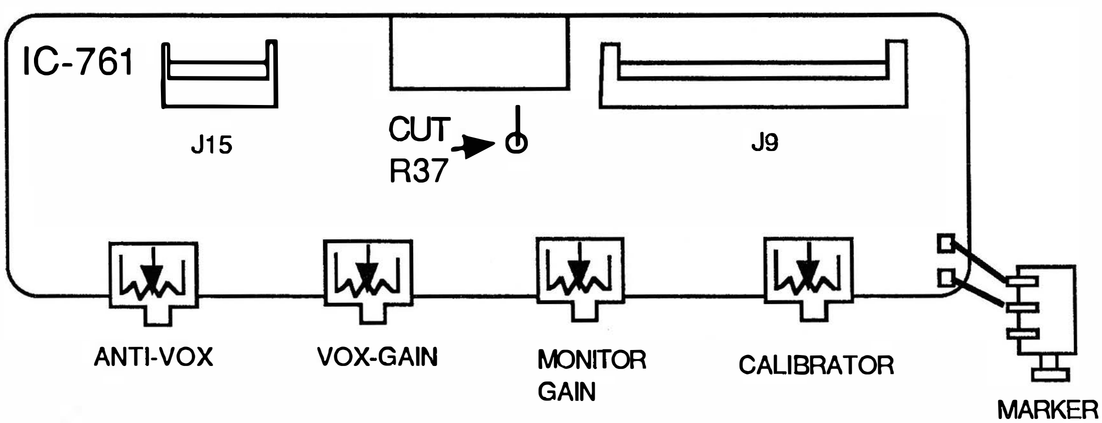
1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate RF board on the side of the radio.
4. Cut the black wire on J2 Pin 1.
5. Reassemble the radio.

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ICOM IC-761

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate Front (Marker) Unit.
4. Locate and Cut Resistor R37
5. Reassemble radio.



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ICOM IC-765

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws and open bottom cover.
3. Locate and remove diode D53.
   Note: (It is the only part on the bottom of the circuit board).
4. Reassemble the radio.

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ICOM IC-781

EXPANDED RF

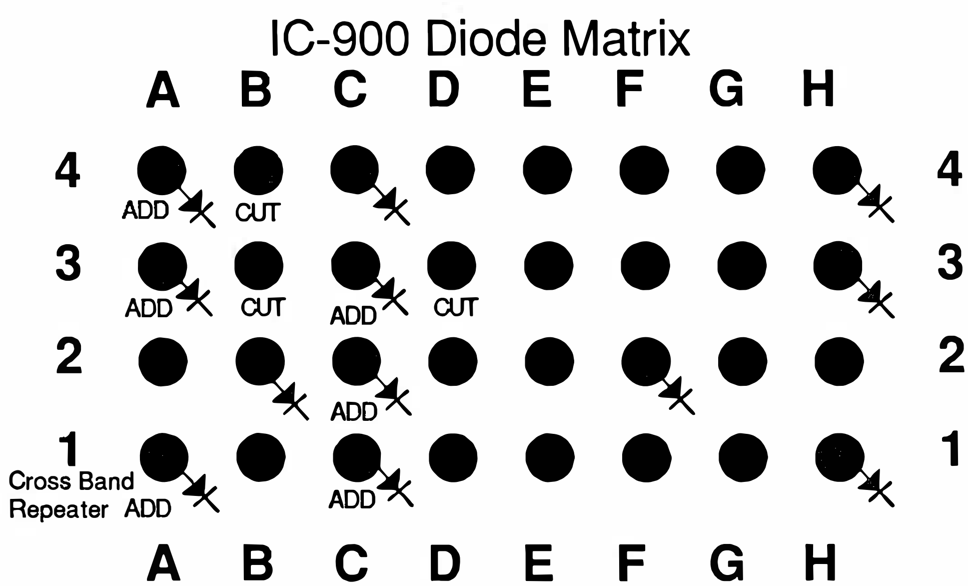
1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and cut Resistor R80 on Logic B unit.
4. Reset the Microprocessor.
5. Reassemble the radio

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ICOM IC-900

EXPANDED RF / CROSS BAND REPEATER

1. Open Control Head
2. Locate Diode Matrix on Display B board of Control Head.
3. Add and remove Diodes according to drawing
4. Reassemble control Head.
5. Open Interface A unit.
6. Change the switch position from "1" (factory) to "2" on interface A board (below the tone units).
7. Reassemble Interface A.



CROSS BAND REPEATER PROCEDURES (Simplex Freqs only)

TURN ON - Turn LOCK switch ON.

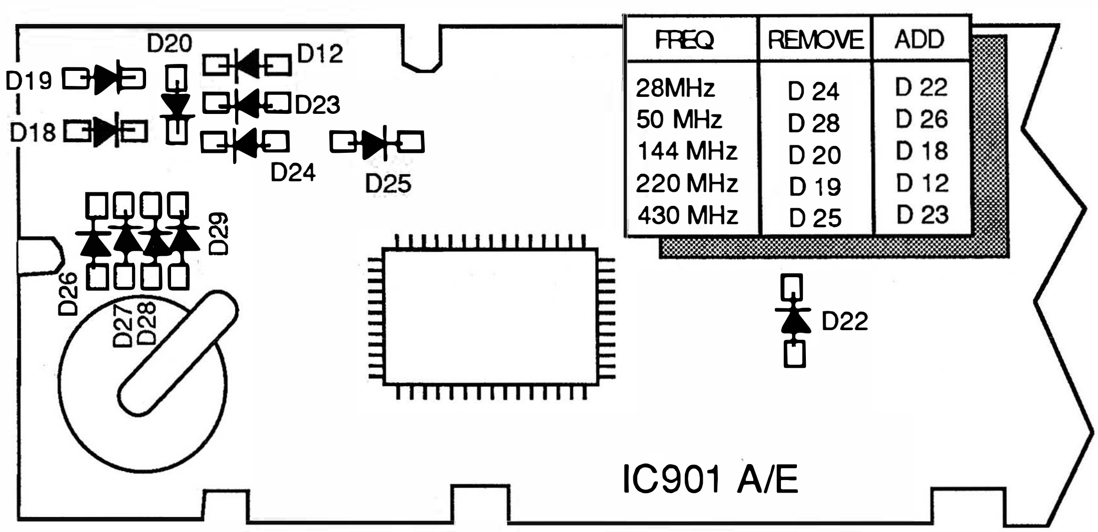
TURN OFF - Turn LOCK switch OFF.

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ICOM IC-901A

EXPANDED RF - CROSS BAND REPEATER

1. Remove control head Cable.
2. Remove screws and open case.
3. Located and remove diodes D24, D28, D20, D19 and D25.
4. Attach diodes D22, D26, D18 D12, D23.
5. Remove Diode D27 (Cross band repeater mod).
6. Reassemble control head.



FREQ	REMOVE	ADD
28MHz	D 24	D 22
50 MHz	D 28	D 26
144 MHz	D 20	D 18
220 MHz	D 19	D 12
430 MHz	D 25	D 23

TO ACTIVATE CROSS BAND REPEATER MODE:

1. Turn the power off.
2. Push and hold [CHECK] and [LOCK] and turn power on.

TO DEACTIVATE CROSS BAND REPEATER MODE:

1. PRESS [LOCK] BUTTON.

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ICOM IC-1200

EXPANDED RF 870-960 MHz

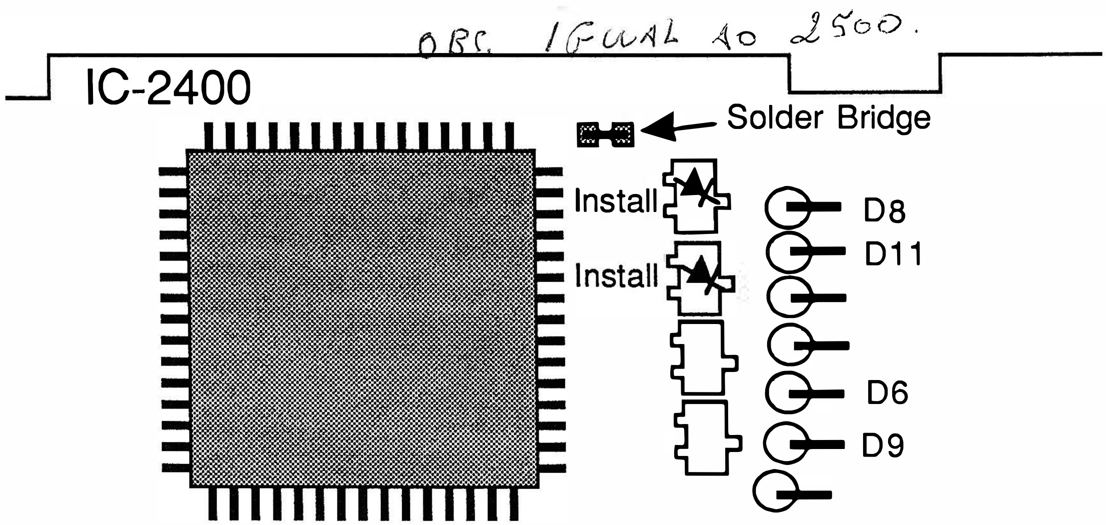
1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and cut Resistor R52 on Logic A unit.
4. Install a new antenna connector to position J2 on RF board.
   Note: a different antenna is required for the 870-960 bands
5. Reassemble the radio.

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ICOM IC-2400

EXPANDED RF / CROSS BAND REPEATER

1. Remove Battery and Antenna.
2. Remove screws open case.
3. Locate and cut diode D11. (440 Mod)
4. Locate and cut diode D 6.(440 Mod)
5. Install chip diode . (see drawing)(440 Mod)
6. Locate and cut diode D11
7. Locate and cut diode D8
8. Install chip diode. (see drawing)
9. Solder jump pads.
10. Locate and cut D 9 (Repeater Mod)



CROSS BAND REPEATER PROCEDURES

TURN ON - Push and hold [SET], [MONI] & [MHZ] & Mic down Button and turn power on.

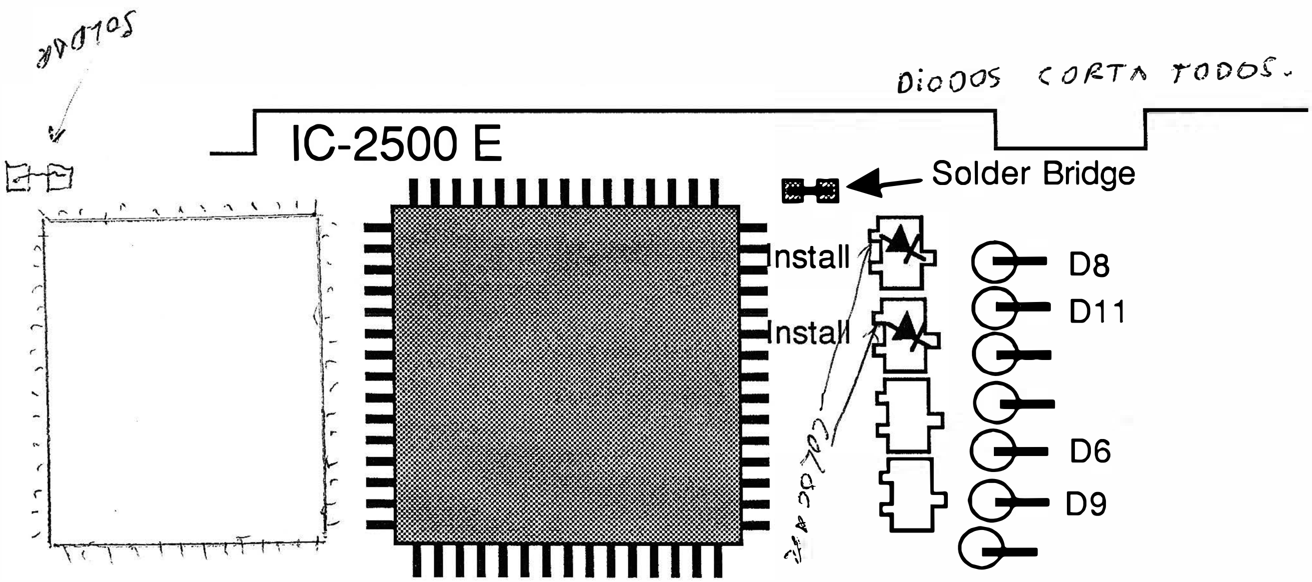
TURN OFF - Push and hold [SET] then press [MHZ]

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ICOM IC-2500

EXPANDED RF / CROSS BAND REPEATER

1. Remove Battery and Antenna.
2. Remove screws open case.
3. Locate and cut diode D11. (440 Mod)
4. Locate and cut diode D 6.(440 Mod)
5. Install chip diode . (see drawing)(440 Mod)
6. Locate and cut diode D11
7. Locate and cut diode D8
8. Install chip diode. (see drawing)
9. Solder jump pads.
10. Locate and cut D 9 (Repeater mod)



CROSS BAND REPEATER PROCEDURES

TURN ON - Push and hold [SET], [MONI] & [CALL] & Mic down Button and turn power on.

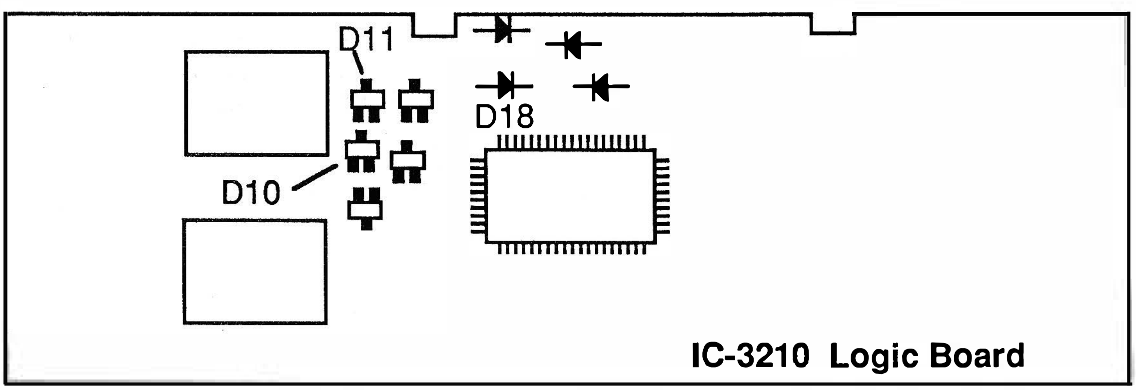
TURN OFF - Push and hold [SET] then press [MHZ]

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ICOM IC-3210

EXPANDED RF / CROSS BAND REPEATER

1. Remove Battery and Antenna.
2. Remove screws open case.
3. Locate and cut diode D17. (Already removed in USA version)
4. Replace chip diode D10 in position A. (New: 1SS184 B3)
5. Locate and cut diode D18.
6. Replace chip diode D11 in position B (old: 1SS196 New: 1SS184 (B3))
7. Locate and cut diode D14. (Repeater mod)
8. Reassemble radio
9. Reset microprocessor. Push and hold [Monitor switch] & [VFO/M] & Mic [DOWN] switch & turn power on.



CROSS BAND REPEATER PROCEDURES

TURN ON - Set radio to "SPT mode". Push and hold "Band switch & "Lock switch" ("SPT" and "L" will flash)

TURN OFF - Press [LOCK] switch.

ICOM IC-3220

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws open case.
3. Locate and Cut Diode D4 on the LOGIC board. (VHF)
4. Locate and Cut Diode D5 on the LOGIC board. (UHF)
5. Install a jumper at "land" point. (VHF)
6. Install a diode (1SS190) at Location D9 on the LOGIC board.
7. Reassemble radio
8. Reset microprocessor.

FREQ 118.000 - 135.995 MHz (AM) RX 136.000 - 174.000 MHz (FM) RX
136.000 - 174.000 MHz (FM) TX
440.000 - 479.000 MHz (FM) RX & TX

CROSS BAND REPEATER PROCEDURES

TURN ON - Set VHF & UHF Frequencies in DUAL WATCH mode. Press and hold [BAND] and press [SET]. Memory channel will show a flashing "L"

TURN OFF - Press [SET] key. Turning off the radio will not disable repeater mode.

Note: The Mic PTT will still operate the radio in repeater mode!!!

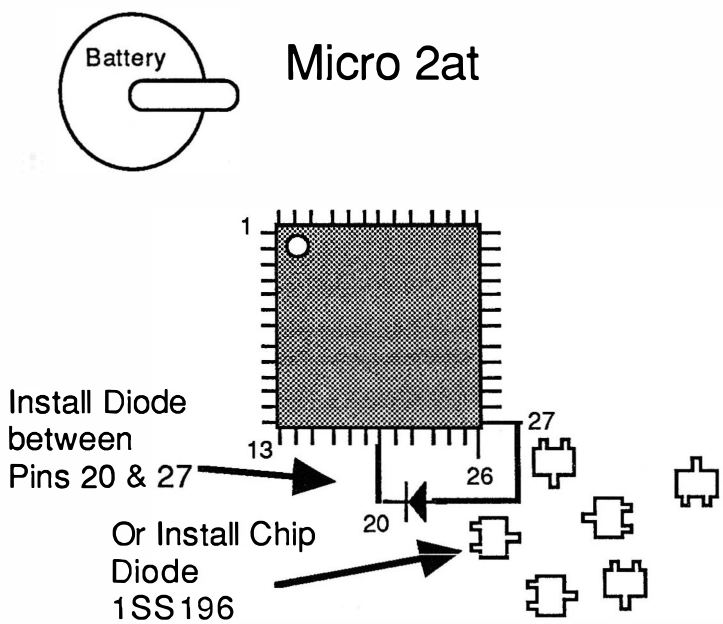
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ICOM μ2AT

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove 4 screws and open Radio
4. Tack solder a 1N914 Diode across Pin 20 & 27
   or attach a chip Diode 1SS196 as shown.
5. Reassemble the Radio.
6. Reset the Micro Processor. (Push and hold lamp and turn on power.)

Note: This diode is placed across pin 20 & 27 of CPU. Drawing is not to Scale.
MICROPROCESSOR is under the Tone Pad (under shield)

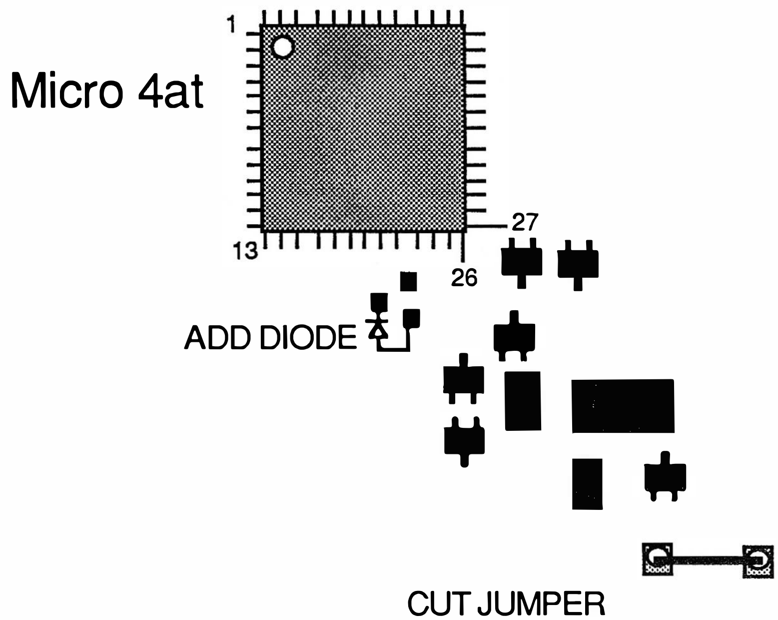


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ICOM μ4AT

EXPANDED RF

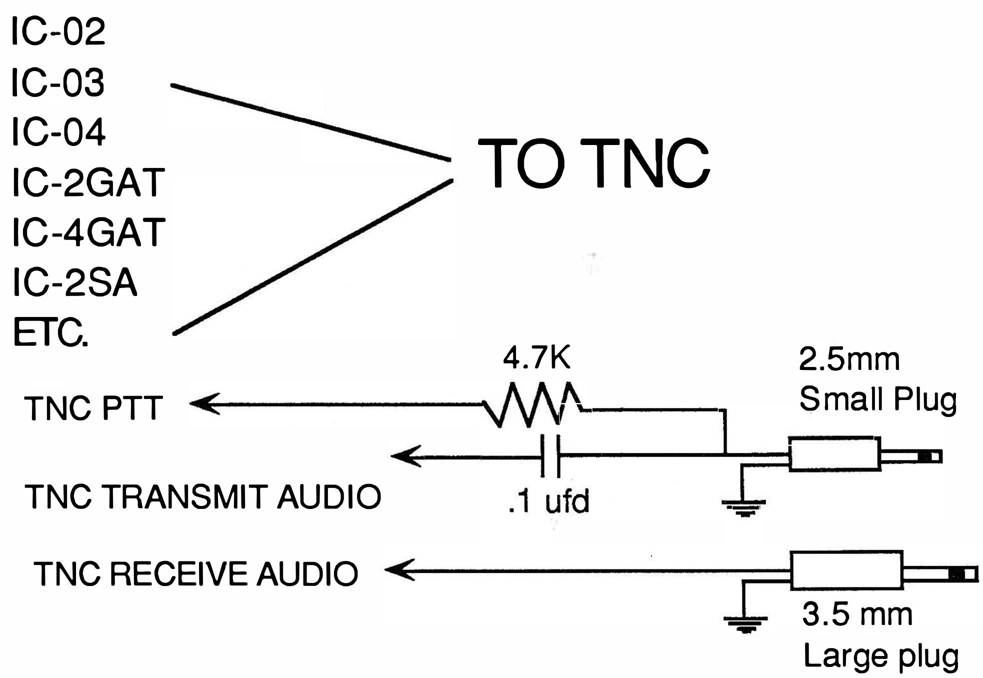
1. Remove Battery and Antenna.
2. Remove 4 screws and open Radio
4. Tack solder a 1N914 Diode across chip diode position.
   or attach a chip Diode 1SS196.
5. Reassemble the Radio.
6. Reset the Micro Processor. (Push and hold lamp and turn on power.)



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ICOM HT's TO TNC'S

INTERFACE CABLES



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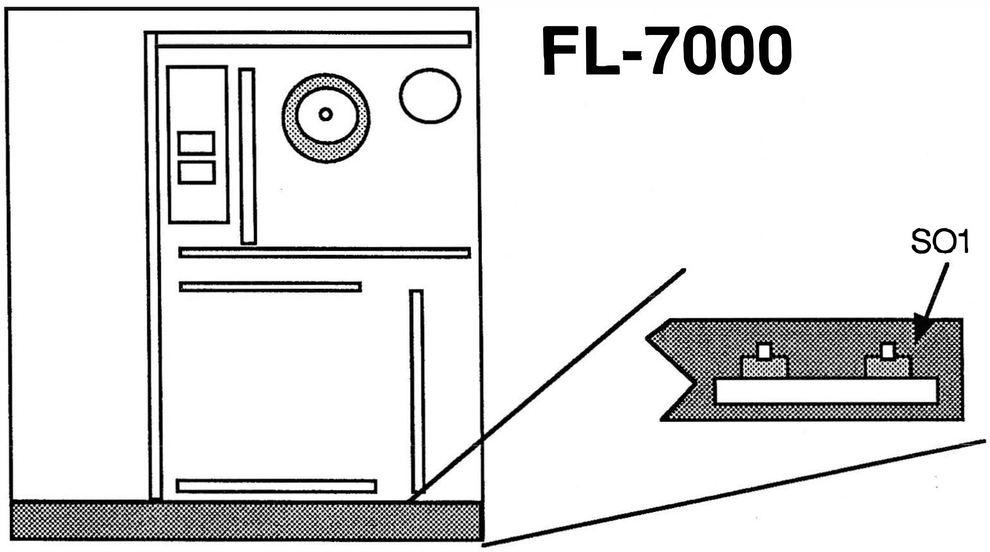
Radio / Tech Modifications

YAESU Radio Modifications

YAESU FL-7000

EXPANDED RF 24.5 MHz & 28.0 MHz Band

1. Remove Power cable and all other cables.
2. Remove 4 screws from the top cover.
3. Remove the top cover and the right and left panels.
4. Remove 4 screws from the power combiner unit and remove screen plate.
5. Locate Switch SO1 on the CPU unit and set it to the off position. (A small screwdriver can be used to reach the switch.)
6. Reassemble the unit.

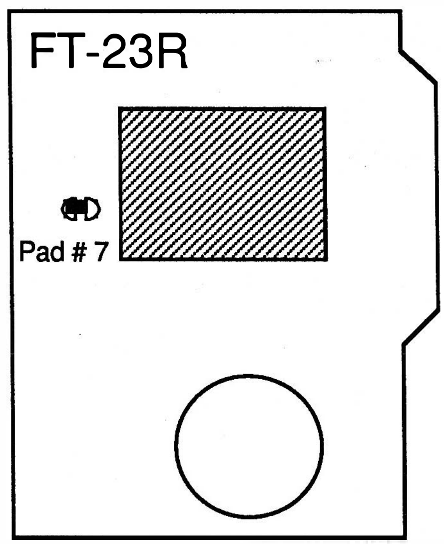


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YAESU FT-23R

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove control knobs, screws,top panel, battery mounting track & body screws and open Radio
3. Remove solder bridge from Pad # 7
4. Reassemble radio.



Range : RX 140 MHz - 163.995 MHz
TX 140 MHz - 163.995 MHz

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YAESU FT-33R

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove control knobs, screws,top panel, battery mounting track & body screws and open Radio
3. For display 220-550 MHz Pads 7,8 and 9 are open
   For display 50-300 MHz Pads 8 and 9 are open and 7 is bridged
4. Reassemble radio.

Note: The exact TX and RX range is determined by the coils and other circuitry in the radio.

YAESU FT-209

EXPANDED RF

1. Remove battery and antenna.
2. Remove battery screws, belt clip screws and side strap screws.
3. Remove black trim on sides of the radio.
4. Remove the two side screws and slide the u-shaped back cover off.
5. Remove the four tiny phillips screws holding the front panel on.
6. Fold panel to the right to open the radio
7. Locate Jumpers 1 through 16
8. Jump pins 1,7,9,10,11,13 & 16
9. Reassemble the radio.
10. Reset the microprocessor
11. Enter 1440 [D], 1590 [D], 1440 [D], 1590 [D], 0600 [SHIFT]
    Note: RX range of 144.0 - 159.0 MHz and TX range of 144.0 - 159.0 MHz

YAESU FT-212

EXPANDED RF

Auto Repeater offset is lost

1. Unplug the DC power cable from the radio.
2. Remove the top and bottom covers.
3. Remove the speaker.
4. Remove the knobs and nuts from the front panel.
5. Remove the three screws from the control unit.
6. Remove the Control unit from the front panel.
7. Remove solder from pad #1 on control unit.
8. Solder jumper Pads 3,4,11 and 14.
9. Replace the control unit on the front panel.
10. Reset the microprocessor. (using a jumper short D09 on the control unit to ground on the radio. Do not apply power).
11. Apply DC power and turn radio on.
12. Press [MR] and use the control knob to enter 140 and pres [D/MR]. (lower limit)
13. Press [MR] and use knob to enter 173 and press [D/MR]. (upper limit)
14. Press [F] and then [RpT} button. use the control knob to enter 0.600. Press the [RpT] button.
15. Reassemble the radio.

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YAESU FT-227R

EXPANDED RF

1. Unplug the power from the radio.
2. Open radio and locate the PLL CONT. UNIT.
3. Remove D701 and D702. Do not place in a jumper.
4. Locate Q712 (MC14028B), and break the connection to Pin 6. (Blue wire)
5. Connect pin 1 of Q711 (red wire) to ground.
6. Reassemble radio

Note: Automatic repeater offset is lost.

TX Range 143.990 MHz - 149.000 MHz

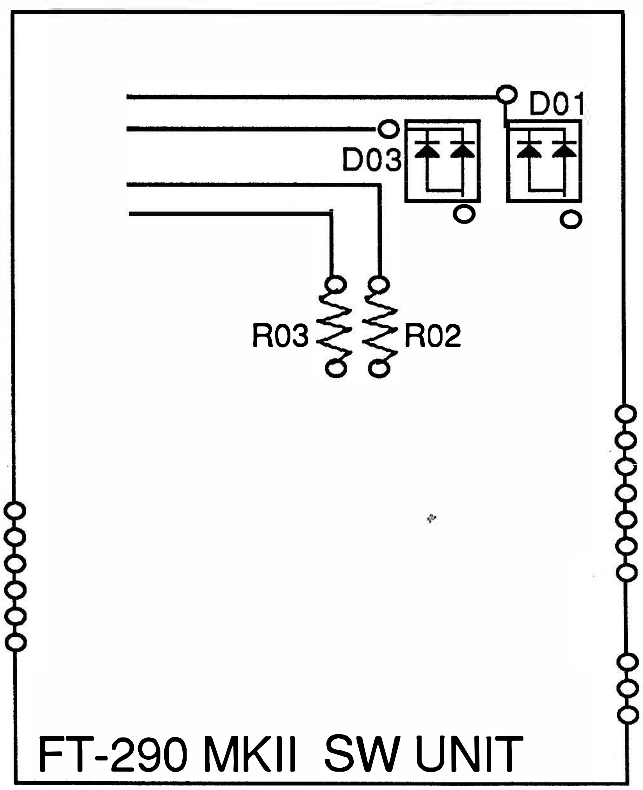
YAESU FT-290 MKII

EXPANDED RF

1. Unplug the power from the radio.
2. Open radio and located SW Unit.
3. Locate components D01, D03, R02 & R03 See drawing.
4. Remove or Install the components per table 1.
5. Reassemble radio.

D01	D03	R02	R03	
●	●	○	●	144 - 148 MHz
●	●	○	○	140 - 150 MHz
●	●	●	○	144 - 146 MHz
●	○	●	○	144 - 154 MHz

● Installed
○ Removed



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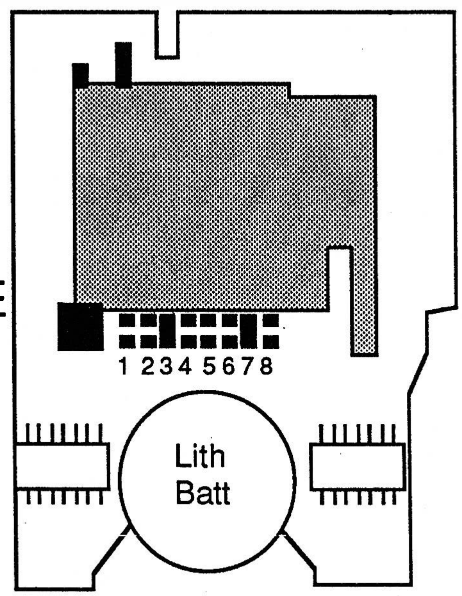
YAESU FT-411

EXPANDED RF

(disables automatic repeater shift)

1. Remove Battery and Antenna.
2. Remove control knobs, screws,top panel & body screws and open Radio
3. Remove solder bridge from Pad # 2
4. Place solder Bridge on Pad # 3
5. Reassemble Radio
6. Reset Microprocessor. (Press and hold [MR] & [VFO] and turn radio on then off)
   (Press and hold both up and down keys and turn power on)
7. Enter the following: 1200 [VFO] 1740 [VFO] 1400 [VFO] 1740 [VFO]
8. Press [Function] & [7] to change channel step.

FT-411
&
FT-411E



Pads 1,2, & 4 OPEN
Pad 3 & 7 Closed (soldered)

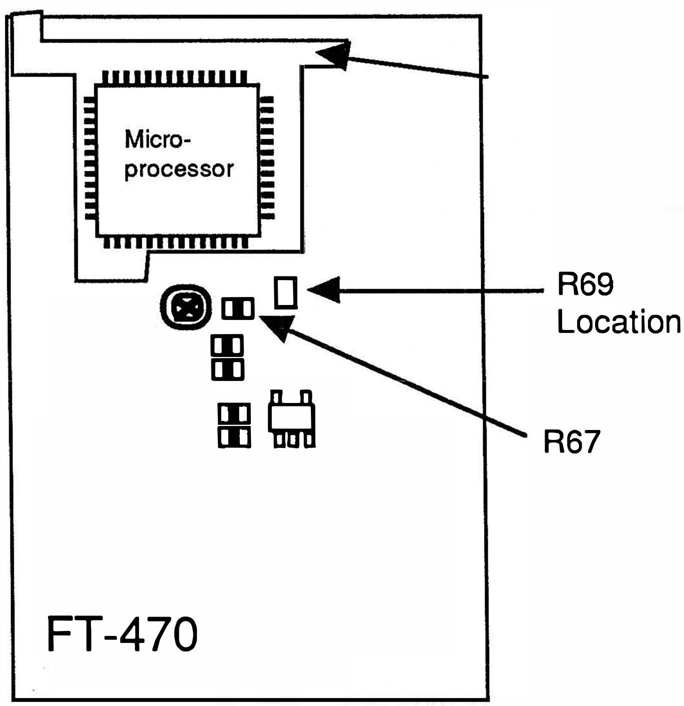
RANGE: RX 120 MHz - 174 MHz
TX 140 Mhz - 174 MHz

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YAESU FT-470

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove control knobs, screws,top panel & body screws and open Radio
3. Locate the lithium battery.
4. Carefully unsolder the lithium battery and lift it to expose resistor position R69.
5. Solder a Jumper or 0 ohm resistor in the empty R69 position.
6. Solder the lithium battery back in place.
7. Reassemble the radio.



Not to Scale!!!

Range 140 MHz - 174 MHz

Note: Freq. expansion is possible using the keyboard only:

1. Press and hold [MR] and [VFO] Buttons and turn radio on
2. Release buttons and turn radio off. (Stop here for normal operation)
3. Press and hold [up] and [down] buttons and turn radio on.
   Range: 140-150 MHz TX/RX and 430-450 MHz TX/RX

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YAESU FT-709

EXPANDED RF

1. Remove battery and antenna.
2. Remove battery screws, belt clip screws and side strap screws.
3. Remove black trim on sides of the radio.
4. Remove the two side screws and slide the u-shaped back cover off.
5. Remove the four tiny phillips screws holding the front panel on.
6. The ground jumper on the left side needs to be unsoldered.
7. Fold panel to the right to open the radio
8. Locate Jumpers 1 through 16
9. Jump pins 1,4,7,9,10,11,13 & 16
10. Reassemble the radio.
11. Reset the microprocessor
12. On FT-709 enter 4400 [D], 4650 [D], 4400 [D], 4650 [D]. 5000 [SHIFT]
    Note: RX range of 440.0 - 465.0 MHz and TX range of 440.0 - 465.0 MHz

YAESU FT-712RH

EXPANDED RF

1. Unplug the DC power cable from the radio.
2. Remove the top and bottom covers.
3. Remove the speaker.
4. Remove the knobs and nuts from the front panel.
5. Remove the three screws from the control unit.
6. Remove the Control unit from the front panel.
7. Remove solder from pad #1 and Pad #2 on control unit.
8. Solder jumper Pads 4 and 14. Pads 3,4,5,7,11 and 14 will be bridged
9. Replace the control unit on the front panel.
10. Reset the microprocessor. (using a jumper short D09 on the control unit to ground on the radio. Do not apply power).
11. Apply DC power and turn radio on.
12. Press [MR] and use the control knob to enter 430 and pres [D/MR]. (lower limit)
13. Press [MR] and use knob to enter 501 and press [D/MR]. (upper limit)
14. Press [F] and then [RpT} button. use the control knob to enter 5.000. Press the [RpT] button.
15. Reassemble the radio.

RANGE: 430 MHz - 465 MHz

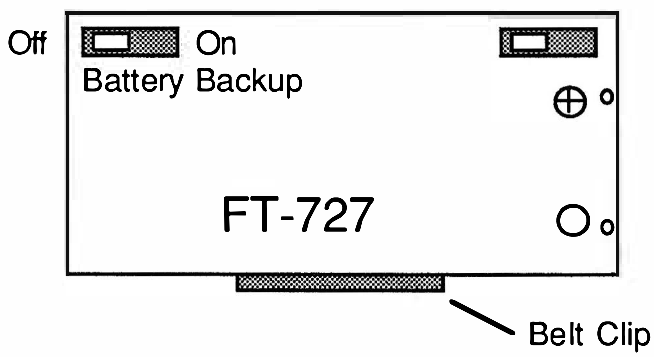
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YAESU FT-727

(no 12.5 KHz steps in 440 band)

EXPANDED RF

1. Remove Battery
2. Turn off the Battery backup switch. (located on the bottom of the radio)
3. Wait 10 Seconds and Turn the switch back on
4. Replace battery
5. Turn Radio ON. (Display should go blank, if not redo steps 1-4)
6. Enter the following: 001111 (note: factory setting is 443300)
7. Reset the VHF & UHF offsets.
   Select VHF then Press [F] then the [Shift] button.
   Enter 0600 then [D]
   Select UHF then Press [F] then the [Shift] button.
   Enter 5000 then [D]



PLL alignment for out of band

1. Remove battery,and belt clip
2. Remove battery track screws
3. Remove rear cover
4. Install the battery track.
5. Turn radio on & enter desired frequency
6. Adjust L01 (black slug) in VCO unit until the on air lamp is lit (red light)
   (L01 coreturn counter-clock wise)
7. Reassemble radio

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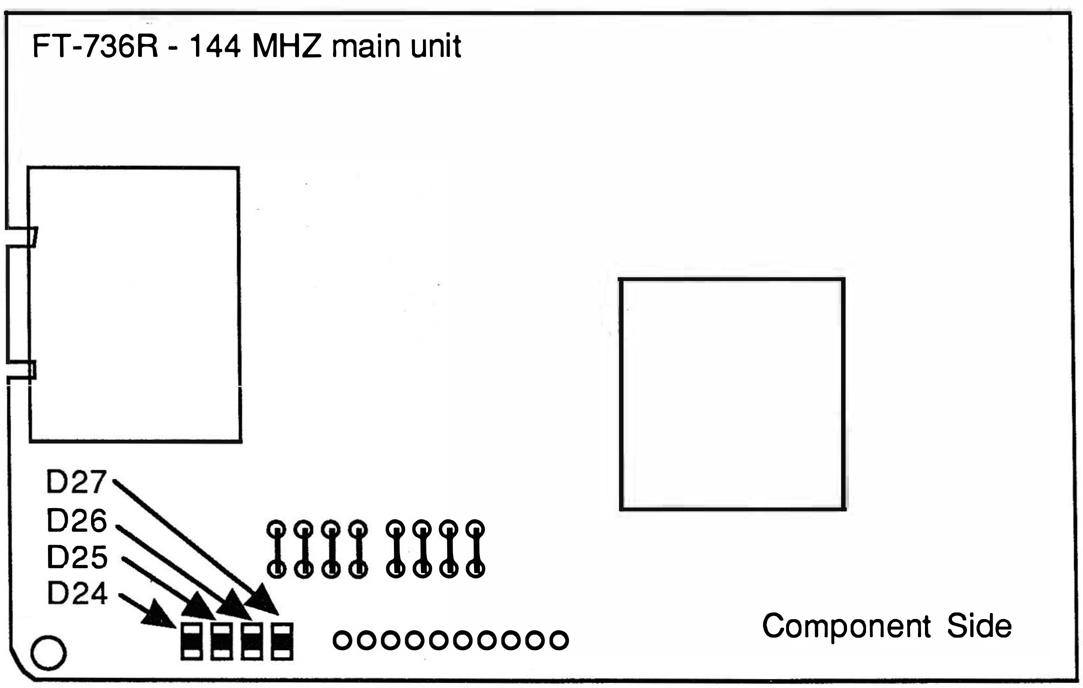
YAESU FT-736R

EXPANDED RF

1. Unplug the power from the radio.
2. Open the radio and locate the 144 MHz main unit.
3. Locate diodes D24, D25, D26 and D27 See drawing.
4. Remove or Install the diodes per table 1.
5. Reassemble radio.

D24	D25	D26	D27	
○	●	●	○	144.0 - 148.0 MHz
○	●	●	●	141.0 - 154.0 MHz
○	○	●	●	144.0 - 146.0 MHz

● Installed
○ Removed

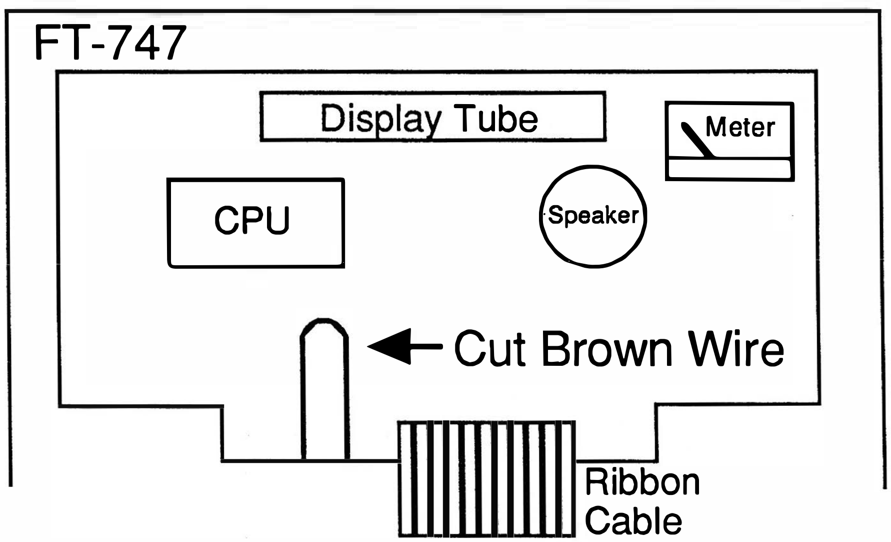


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YAESU FT-747

EXPANDED RF

1. Unplug the DC power cable from the radio
2. Remove the top cover (see instruction manual page 23)
3. Remove or cut the BROWN jumper wire on the display unit. See Drawing
4. Reconnect the power cable and turn the radio on
5. Set the VFO dial to 12.3456 MHz
6. Turn power off and then back on again.
7. Turn power off and reassemble radio. (don't pinch any wires)

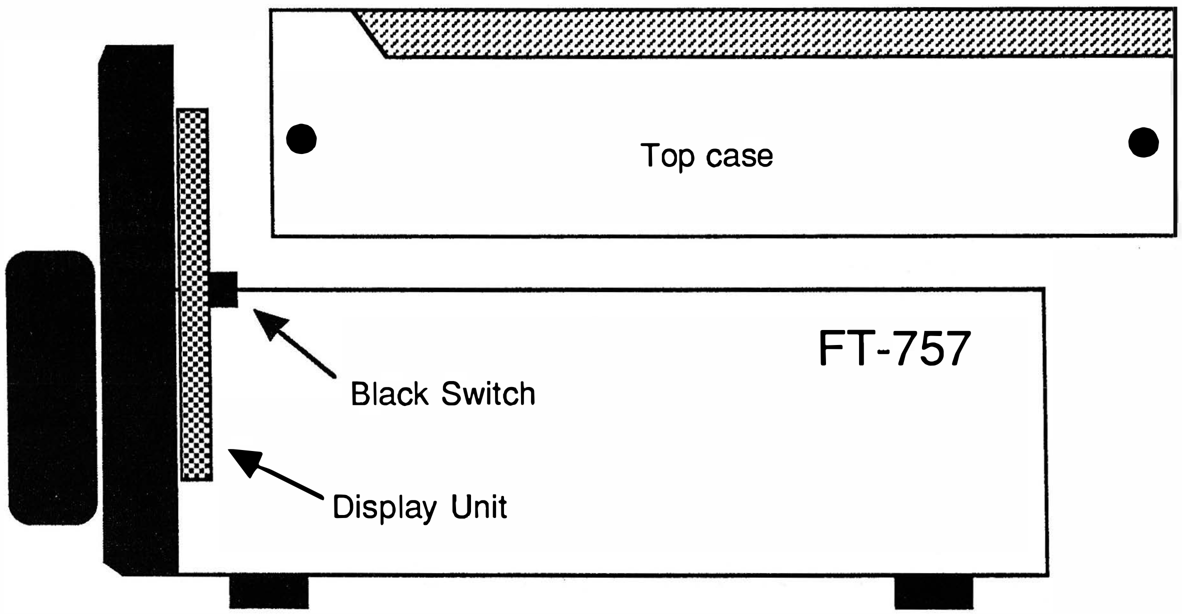


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YAESU FT-757GX & FT 757GX II

EXPANDED RF

1. Unplug the DC power cable from the radio.
2. Remove the top cover (see service manual for cover removal)
3. Locate the Black slide switch on the display panel. (to the right of center and halfway down the backside.
4. Use a screwdriver to set the switch to the left most position.
5. Reassemble the radio.

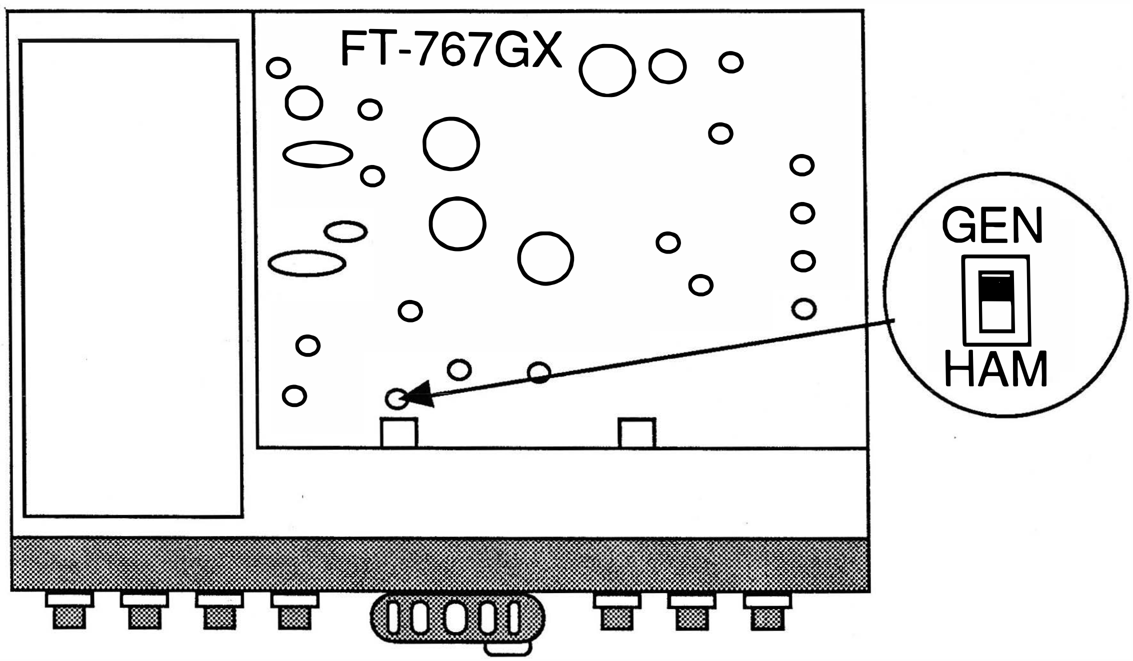


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YAESU FT-767GX

EXPANDED RF

1. Unplug the DC power cable from the radio.
2. Remove the top cover (see service manual for cover removal)
3. Locate the GEN/HAM switch inside the shield cover.
4. Use a screwdriver to set the switch to the GEN position.
5. Reassemble the radio.



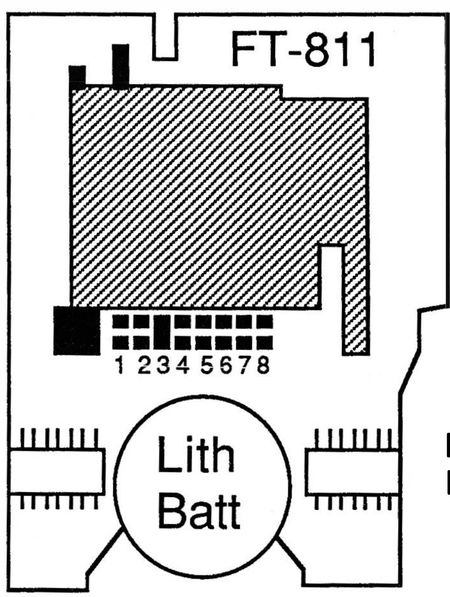
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YAESU FT-811

EXPANDED RF

(disables automatic repeater shift)
For Serial # 9D, 9F and 9J series only.
Serial Numbers above 9N can not be modified

1. Remove Battery and Antenna.
2. Remove control knobs, screws,top panel & body screws and open Radio
3. Remove solder bridge from Pad # 2
4. Remove solder bridge from Pad # 4
4. Place solder Bridge on Pad # 3
5. Reassemble Radio
6. Reset Microprocessor. (Press and hold [MR] & [VFO] and turn radio on then off)
   (Press and hold both up and down keys and turn power on)
7. Enter the following: 4200 [VFO] 4700 [VFO] 4200 [VFO] 4700 [VFO]
8. Press [Function] & [7] to change channel step.



Pads 2 & 4 OPEN
Pad 3 Closed(soldered)

RANGE: RX 420 MHz - 470 MHz
TX 420 Mhz - 470 MHz

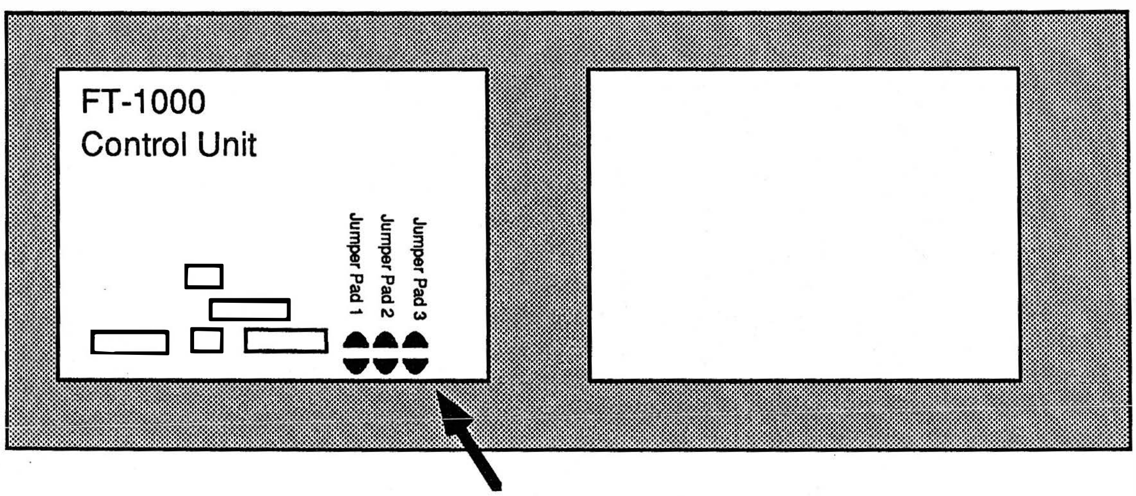
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YAESU FT-1000

EXPANDED RF

1. Remove power from the radio.
2. Open the case top and bottom.
3. Locate four crews attaching front panel and remove the top screws. Loosen the bottom screws.
4. Tilt front panel forward.
5. On the left side of the radio, remove the plug from the power supply to the front panel. (gray and white wires)
6. Locate jumper position 3 on Control board.
7. Change the jumper status in position 3
8. Reassemble the radio.
9. Reset the microprocessor.

FT-1000 FRONT PANEL



Remove Solder Bridge from Pad #3

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YAESU FT-4700

EXPANDED RF

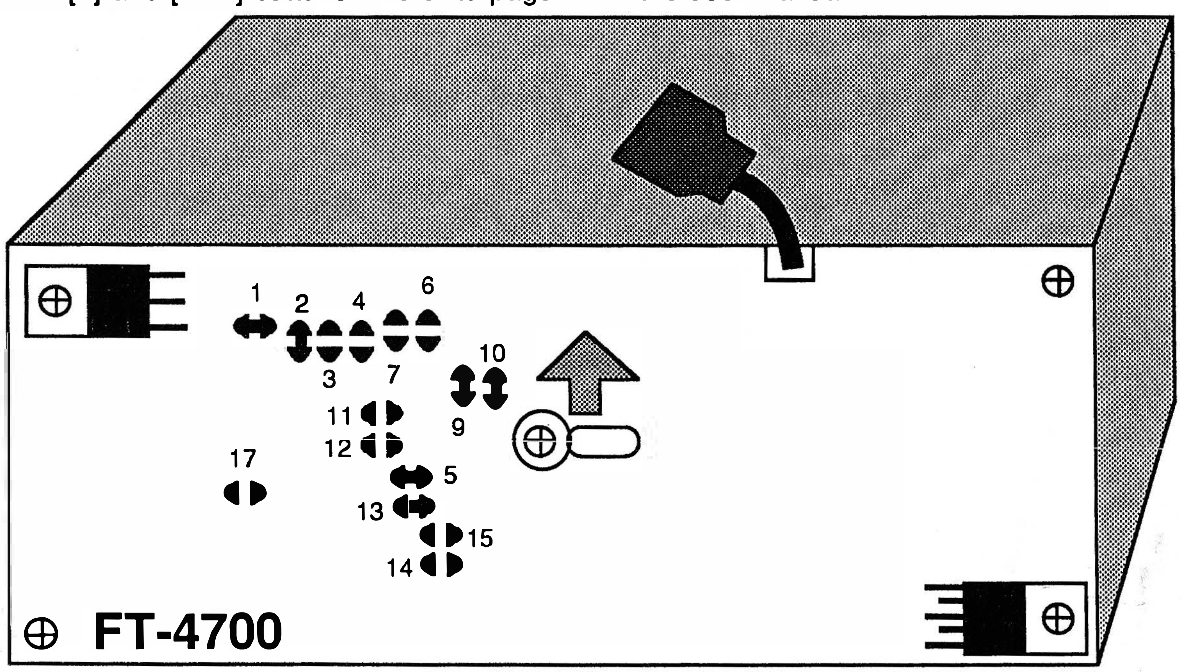
1. Remove Front Panel.
2. Locate jumper pads 1,2,5,9,10 & 13. Solder short them carefully. (The other jumper pads must remain undisturbed)
3. Reassemble radio.
4. Turn power on. (The microprocessor has been reset)
5. Use the up/down buttons and dial to set the UHF range as follows :

   420.000 MHz   Press [D/MR] button
   469.000 MHz   Press [D/MR] button

6. The display will show 47.75 (IF freq. for UHF).   Press [D/MR]
7. Use the up/down buttons and dial to set the VHF range as follows :

   138.000 MHz   Press [D/MR] button
   174.000 MHz   Press [D/MR] button

8. The display will show 17.3 (IF freq. for VHF).   Press [D/MR]
9. The repeater shifts for both bands are reset to 000. They must be set using the [F] and [PRT] buttons. Refer to page 27 in the user manual.



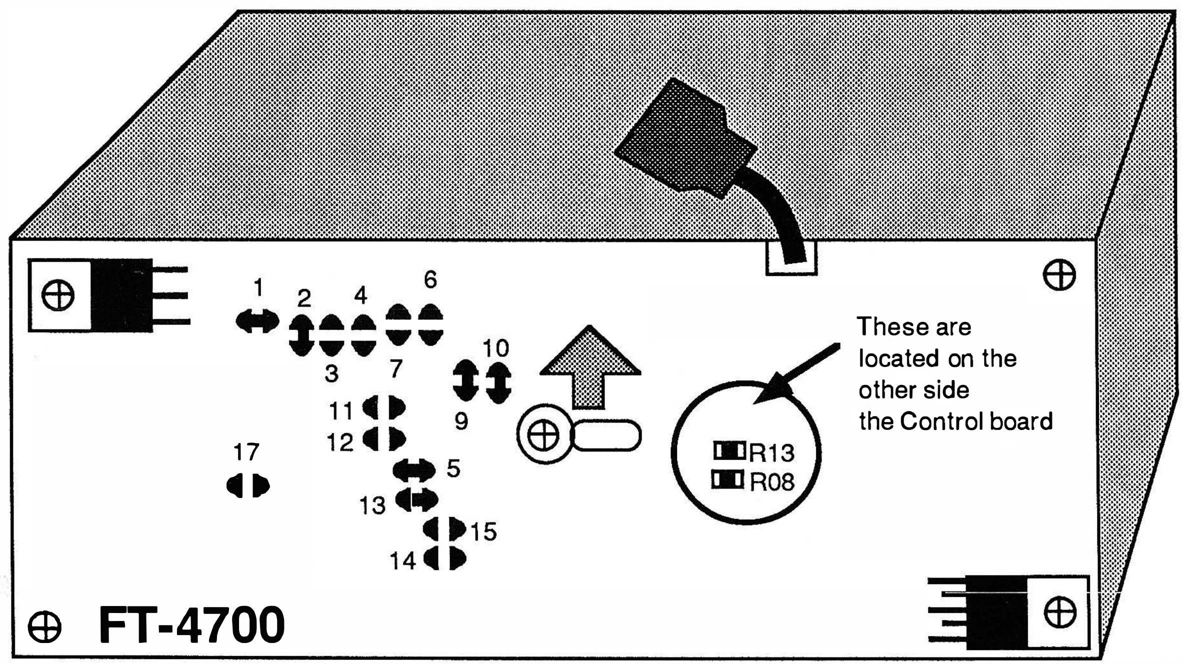
RX Range	138 MHz - 174 MHz
	420 MHz - 469 MHz
TX Range	138 MHz - 174 MHz
	420 MHz - 469 MHz

MORE ------

YAESU FT-4700

BEEP LEVEL REDUCTION

1. Remove Front Panel
2. Remove the five screws holding Control unit in place.
3. Remove P10 from J04
4. Remove P09 from J03
5. Carefully flip the Control board to access the back side.
6. Locate R08 and R13.
7. Replace R08 and R13 with 560 ohm chip resistors (YAESU # J24205561
8. Reconnect the two Plugs P10 & P09
9. Reassemple the radio.

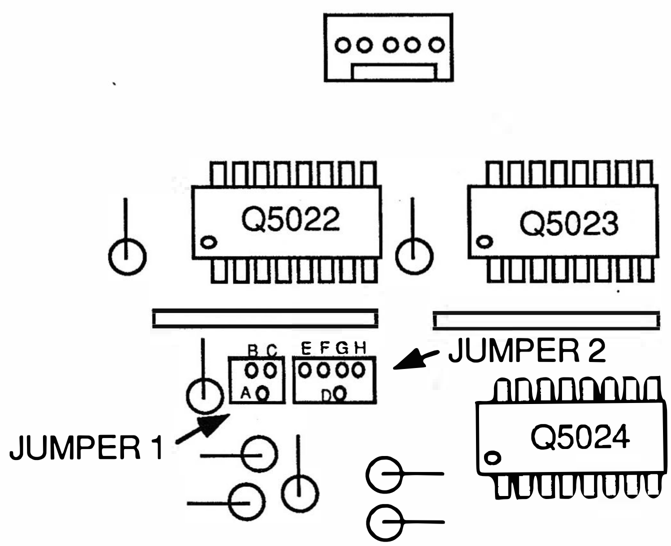


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YAESU FT-ONE

EXPANDED RF

1. Unplug the power from the radio.
2. Open radio and locate the CONTROL UNIT.
3. Locate and install a Jumper between Point A and point B. No Jumper to point C.
4. Remove any jumper to point D. (Transmit range point)
5. Reassemble radio.



RX Range 150 KHz - 30 MHz
TX Range 1.8 MHz - 30 MHz

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YAESU FT-5200

EXPANDED RF

1. Remove power from the radio.
2. Release and remove the front panel.
3. Remove the six screws from the top cover of the radio.
4. Remove the six screws from the bottom of the radio.
5. Remove the top an bottom covers.
   (CAUTION: the speaker might fall out.)
6. Remove the two screws & front control head mounting plate from the radio.
7. Locate solder pads 1 - 7.
   (Standard jumpered pads are 2 and 7 only)
8. Solder jump pads 1,3 and 6
   (Pads 1,2,3,6 & 7 are now jumpered)
9. Install front panel mounting plate.
10. Reassemble the radio.
11. Reconnect the power to the radio.
12. Press and hold [D/MR], [F/W] & [REV] keys and turn radio on.
    (Display will show 000.000 & 300.000 on the display)
13. Set the VHF Receive and Transmit limits:

Enter 118.00 MHz and press [D/MR]	(VHF RX Low)
Enter 174.00 MHz and press [D/MR]	(VHF RX High)
Enter 140.00 MHz and press [D/MR]	(VHF TX Low)
Enter 174.00 MHz and press [D/MR]	(VHF TX High)

14 Set the UHF Receive and Transmit limits:

Enter 420.00 MHz and press [D/MR]	(UHF RX Low)
Enter 475.00 MHz and press [D/MR]	(UHF RX High)
Enter 420.00 MHz and press [D/MR]	(UHF TX Low)
Enter 475.00 MHz and press [D/MR]	(UHF TX High)

15. Press [Function] then [REP] and select 5 MHz Repeater offset for UHF band.
16. Press [Function] then [REP] and select 600 kHz Repeater offset for UHF band.

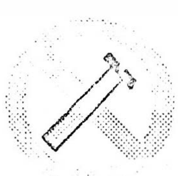
Options:

Override automatic display dimmer:

Press and hold [MHz] and turn radio on: Use Channel knob to select brightness.

Keyboard VHF Expanded Receive:

Press and hold [DVS] & [MHz] keys and turn radio on.


Caution

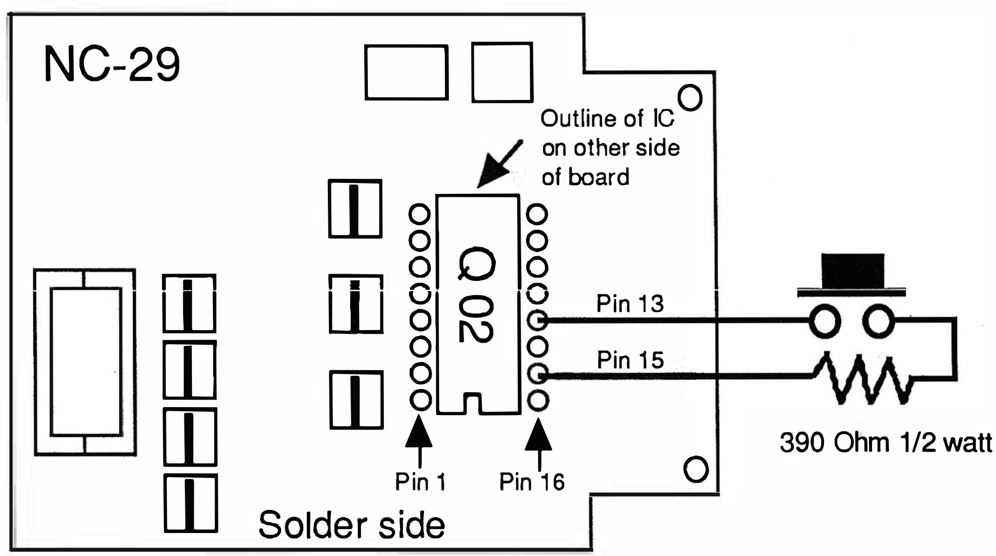
YAESU NC-29

TRICKLE MODE

This modification will allow you to select the amount of time used to fast charge your battery pack. The standard NC-29 will fast charge a battery for five hours and then switch to trickle charge every time a battery is inserted, even if the battery is fully charged.

This modification will provide a push button to speed up the Internal clock. By pressing the button, you can watch the time remaining LEDs on the panel and select the amount of full charging time.

1. Unplug the charger for the AC power
2. Locate IC Q02. see drawing
3. Solder tack a 390 Ohm 1/2 watt resistor and a normally open push button to Pins 13 & 15
4. Position the push button switch in a handy position on the plastic case.



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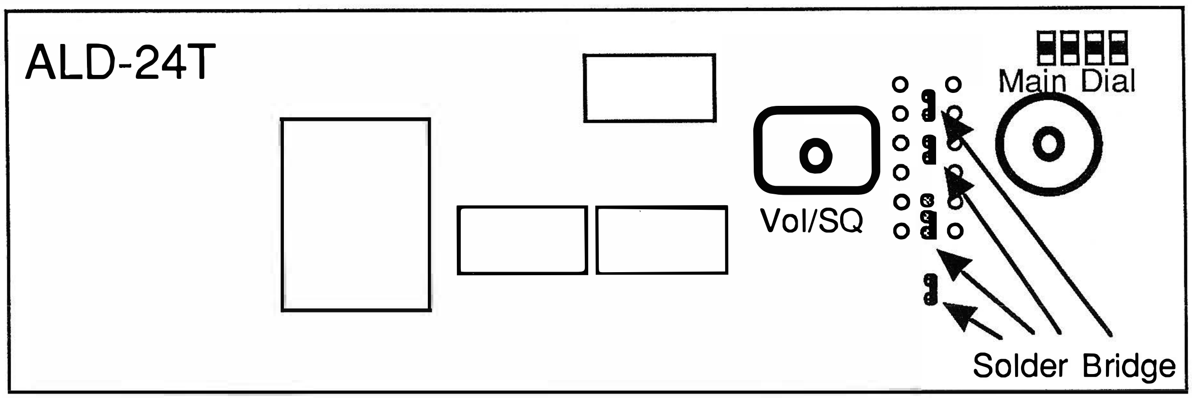
Radio / Tech Modifications

ALINCO Radio Modifications

ALINCO ALD-24T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove top and bottom covers.
3. Remove Main dial,Vol & SQL knobs. Remove the retaining rings.
4. Remove front cover to access front panel circuit board.
5. Solder bridge four sets of pads as shown.
6. Reassemble radio.
7. Reset microprocessor (Press reset button)

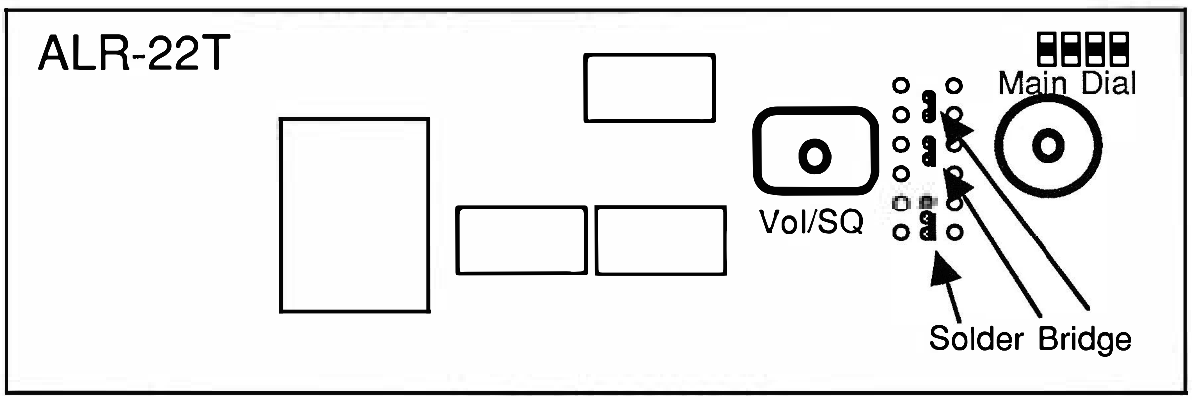


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ALINCO ALR-22T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove top and bottom covers.
3. Remove Main dial,Vol & SQL knobs. Remove the retaining rings.
4. Remove front cover to access front panel circuit board.
5. Solder bridge Three sets of pads as shown.
6. Reassemble radio



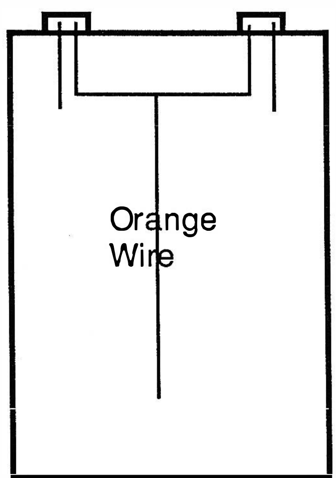
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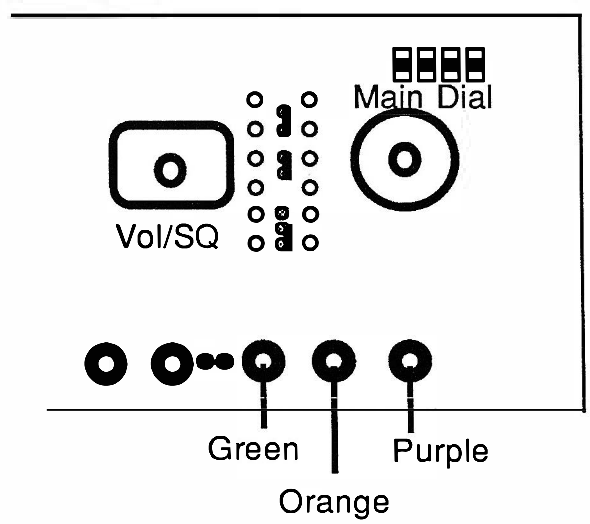
ALINCO ALR-22T

MICROPHONE MOD

1. Remove Battery and Antenna.
2. Remove top and bottom covers.
3. Remove Main dial,Vol & SQL knobs. Remove the retaining rings.
4. Remove front cover to access front panel circuit board.
5. Locate and remove the Microphone Green, Orange & Purple wires.
6. Solder the wired as shown in drawing
7. Reassemble radio.
8. Open Microphone.
9. Remove the Ground side of the Up/Down buttons and tie them together.
10. Connect the Orange wire to the two tied wires.
11. Reassemble Microphone.

ALR-22T
Mic/Memory
UP/Down
Mod



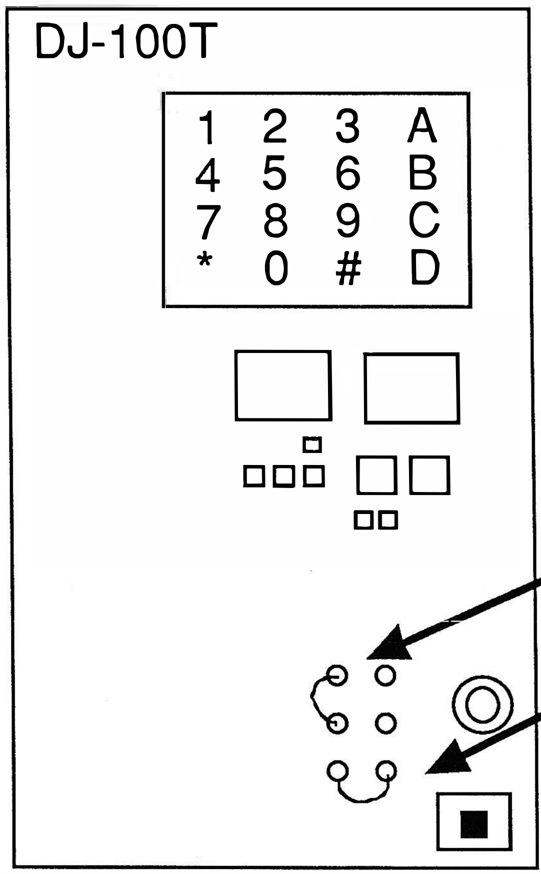


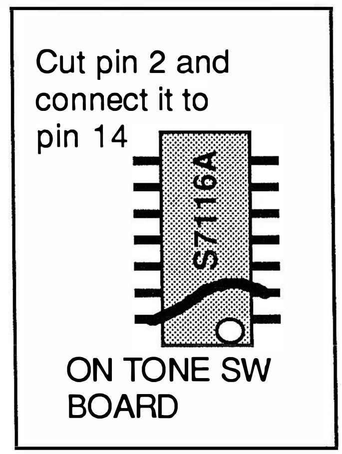
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ALINCO DJ-100T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove screws from case and open radio.
3. Locate & Cut Jumpers per drawing.
4. Clip pin 2 on IC401(S7116A) and connect it to pin 14 (for simplex PL tone) This chip is located on the TONE SW board.
4. Reassemble radio.
5. Reset Micro Processor.



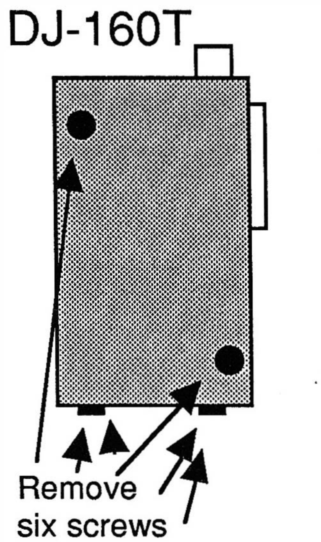


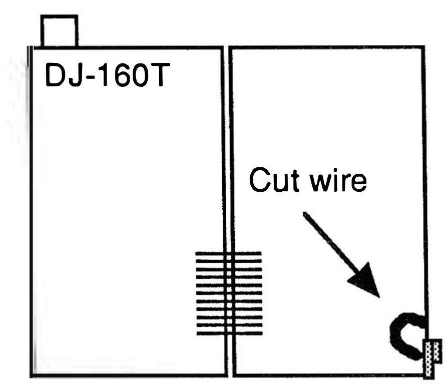
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ALINCO DJ-160T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove 2 screws back of case and four screws from battery slide clip.
3. Remove Main dial,Vol & SQL knobs. Remove the retaining rings.
4. Remove the top cover.
5. Open radio.
6. Locate and cut yellow wire behind the battery release button.
7. Reassemble radio.
8. Reset microprocessor. (Press and hold [F] key and turn power on.



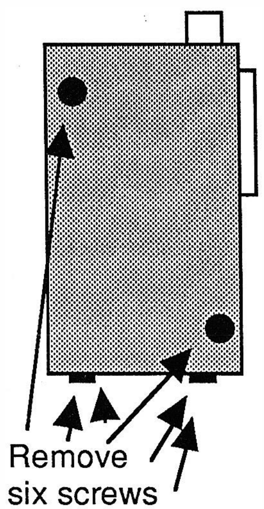


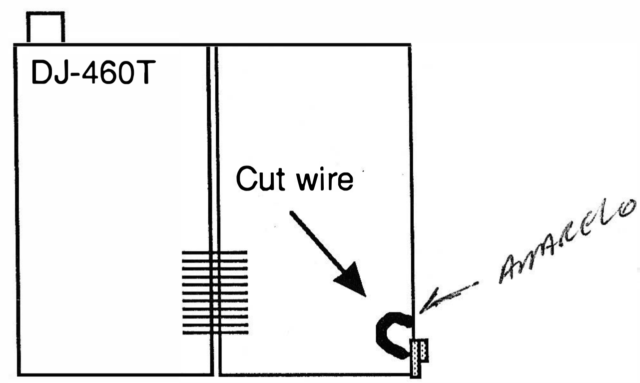
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ALINCO DJ-460T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove 2 screws back of case and four screws from battery slide clip.
3. Remove Main dial,Vol & SQL knobs. Remove the retaining rings.
4. Remove the top cover.
5. Open radio.
6. Locate and cut wire behind the battery release button.
7. Reassemble radio.
8. Reset microprocessor. (Press and hold [F] key and turn power on.



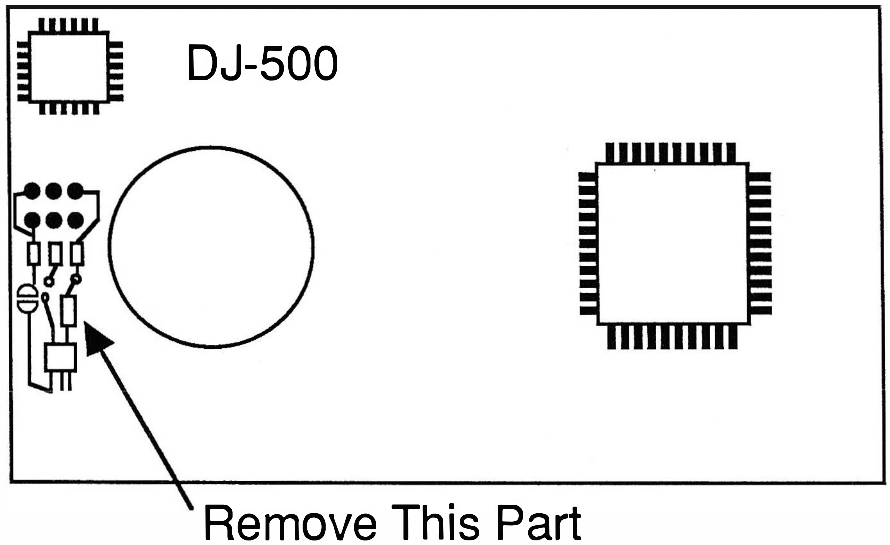


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ALINCO DJ-500T

EXPANDED RF

1. Remove Battery and Antenna.
2. Remove screws from case (3 Long & 2 short)
3. Remove green component per drawing.
4. Reassemble radio.
5. Reset the radio. (Reset switch is located below the PTT Switch

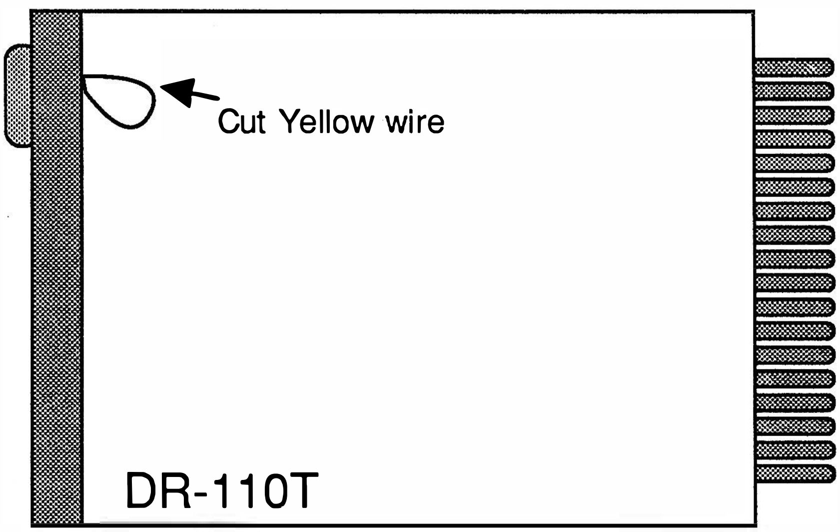


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ALINCO DR-110T E PR 112

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws from top case and open radio.
3. Cut the yellow wire on the control board
4. Reassemble radio
5. Reset microprocessor. (Turn radio on. Press and hold [F] and [VFO/M] and turn power off and while still holding keys, turn power back on.

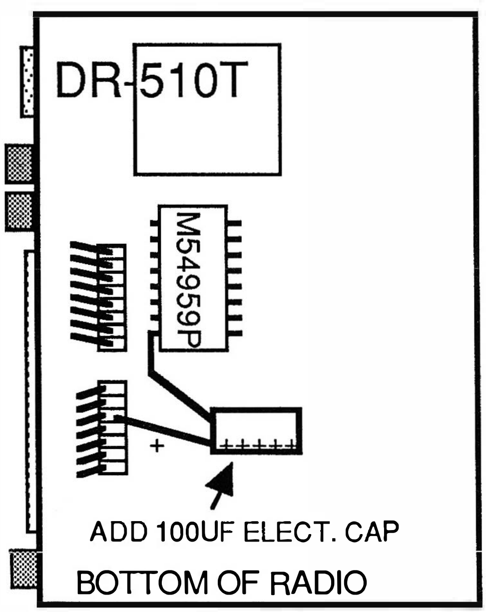


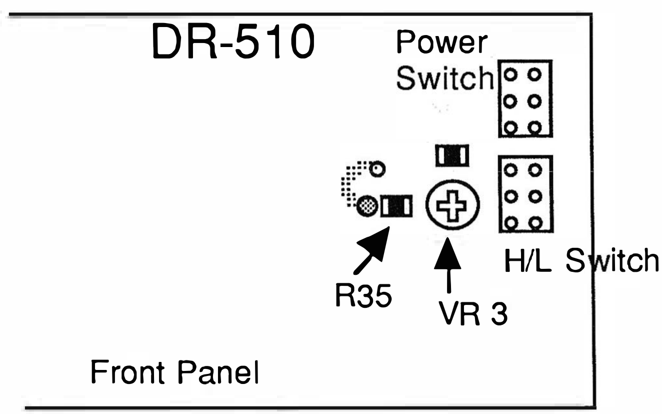
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ALINCO DR-510T

EXPANDED RF / CROSS BAND REPEATER MOD

1. Remove Battery and Antenna.
2. Remove screws from case and open radio.
3. Cut the yellow wire looped around the blue condenser
4. Remove 2 screws from corners of tone board, to expose motherboard.
5. Solder a 16 volt 100uf electrolytic as shown. (note 10-100uf)
   - lead to pin 8 of M54959P + lead to third pin of socket (Orange wire)
6. Remove the front cover
7. Short chip resistor R35 and solder bridge the pads to the left of the resistor.
8. Reassemble radio
9. Reset microprocessor (Push reset button)





CROSS BAND REPEATER PROCEEDURES - Select the VHF & UHF frequencies and press [SHIFT] until "DUAL" appears.

TURN ON : Press and hold [REV] and turn power on. The volume control controls the amount of repeater audio.

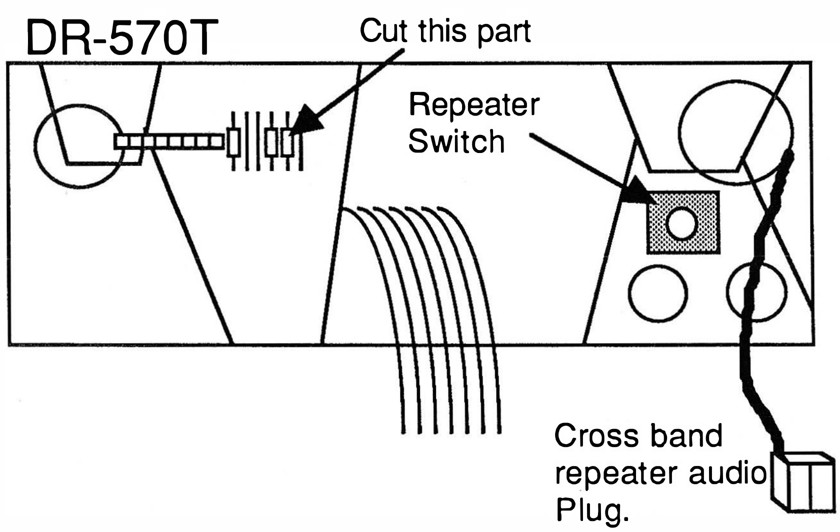
TURN OFF : Turn radio off.

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ALINCO DR-570T

EXPANDED RF / CROSS BAND REPEATER MOD

1. Remove Battery and Antenna.
2. Remove screws from case and open radio (3 screws in the top and 2 in the bottom.)
3. Locate and cut the indicated component. see drawing
4. Turn repeater/normal switch to repeater mode.
5. Reset the microprocessor. (Press and hold [FUNCTION] and turn power on)
6. Remove the two pin connector to disable audio bleed in repeater mode.
7. Reassemble radio.

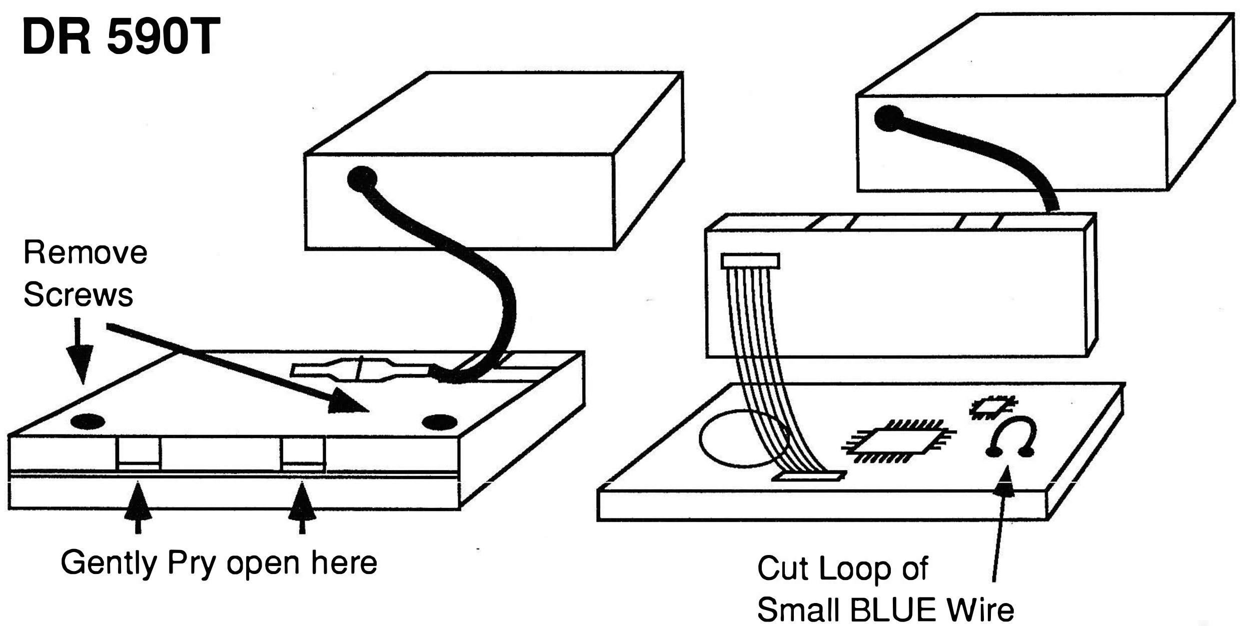


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ALINCO DR-590T

EXPANDED RF
CROSS BAND REPEATER MOD

1. Remove Battery and Antenna.
2. Remove the four screws, (2 on each side) holding the LCD display to the main body of the radio.
3. DO NOT DISCONNECT THE BLACK CONNECTOR CABLE FROM THE LCD DISPLAY.
4. Locate and unscrew the 2 screws holding the LCD display together.
5. Carefully seperate the back cover of the display from the front cover. Use a flat blade screwdriver to apply slight pressure to the locking tabs in the top of the display.
6. Locate and cut the loop of BLUE wire.
7. Reassemble the radio.
8. Reset the microprocessor. (Press and hold the [FUNCTION] key and turn power on.)



ENABLE REPEATER MODE: Simultaneously press the [FUNCTION] key and the [VHF] Key. The display will alternate between VHF and UHF every 3 seconds.

DISABLE REPEATER MODE: Simultaneously press the [FUNCTION] key and the [UHF] Key.

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Radio / Tech Modifications

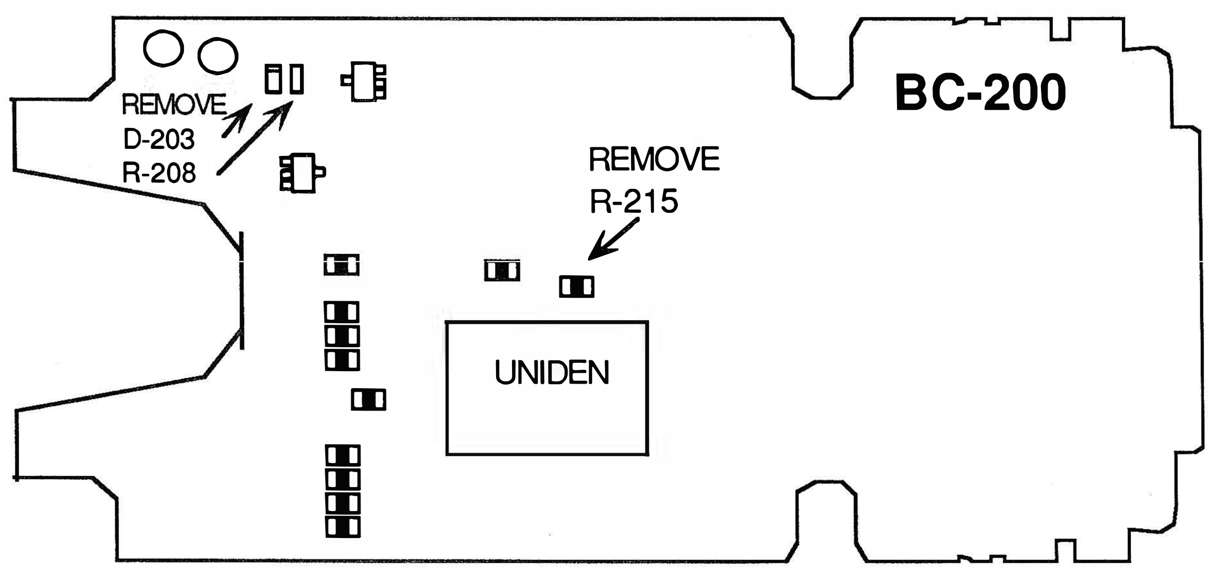
SCANNER / CB Modifications

BEARCAT BC-200

EXPANDED RF (800MHz)
Extended Battery Life

1. Remove Battery and Antenna.
2. Remove 2 screws from case and 2 from the battery retaining plate and open case.
3. Locate and remove two small screws at the base of the circuit board.
4. Gently pull the front panel from the circuits.
5. Locate and remove the 10 K resistor R-215 located above the microprocessor (Uniden UC-1147). Note the resistor is above the "den" letters on the microprocessor.
6. Locate and remove the Diode D-203 and Resistor R-208Located by the Speaker. (Battery Mod)
6. Replace the front panel. Keep the holes in the bottom of the case and board lined up and make sure the dual in-line connector is reconnected properly.
7. Reassemble scanner.

If the radio fails to power up, recharge the battery or, the dual in-line connector was not inserted correctly. f the display will not work, make sure that the rows of fine pin are aligned properly with the socket.



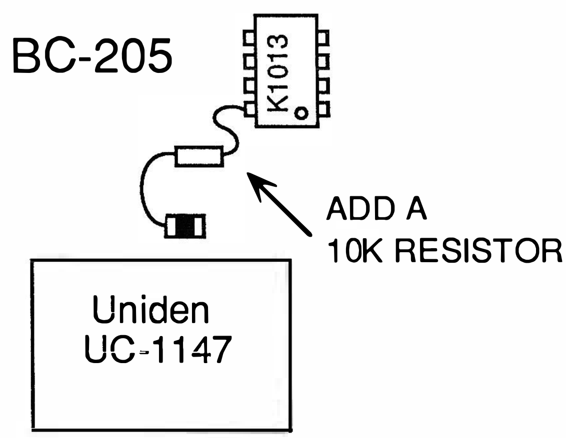
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BEARCAT BC-205

EXPANDED RF (800MHz)
Extended Battery Life

1. Remove Battery and Antenna.
2. Remove 2 screws from case and 2 from the battery retaining plate and open case.
3. Locate and remove two small screws at the base of the circuit board.
4. Gently pull the front panel from the circuits.
5. Locate the 10 K resistor located above the microprocessor (Uniden UC-1147). Note the resistor is above the "den" letters on the microprocessor.
6. Add a 10K Resistor to From the Chip resistor to Pin 8 of the adjacent K1013 IC.
7. Reassemble the radio.

If the radio fails to power up, recharge the battery or, the dual in-line connector was not inserted correctly. f the display will not work, make sure that the rows of fine pin are aligned properly with the socket.

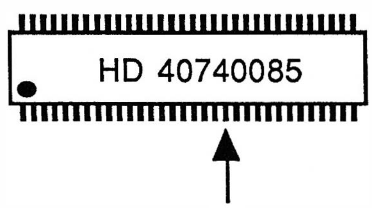


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BEARCAT BC-760
EARLY MODELS (NO BNC CONNECTOR)

EXPANDED RF (800MHz)

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case remove the bottom cover.
3. Locate the microprocessor and clip pin 20.
4. Reassemble scanner.



Clip Pin 20

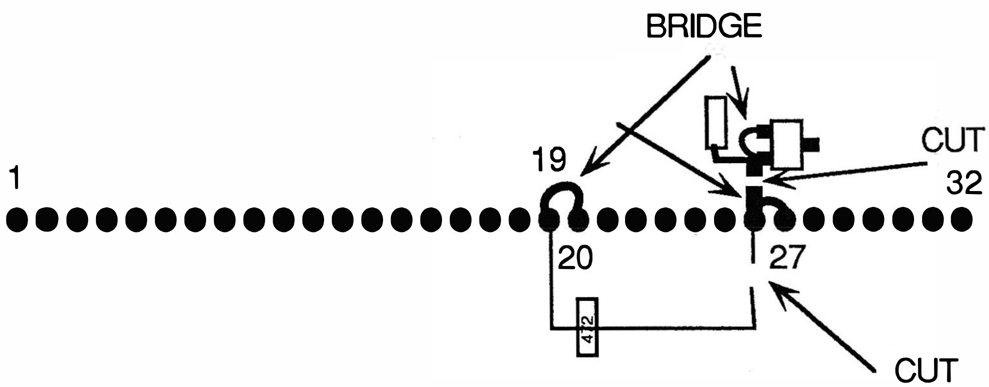
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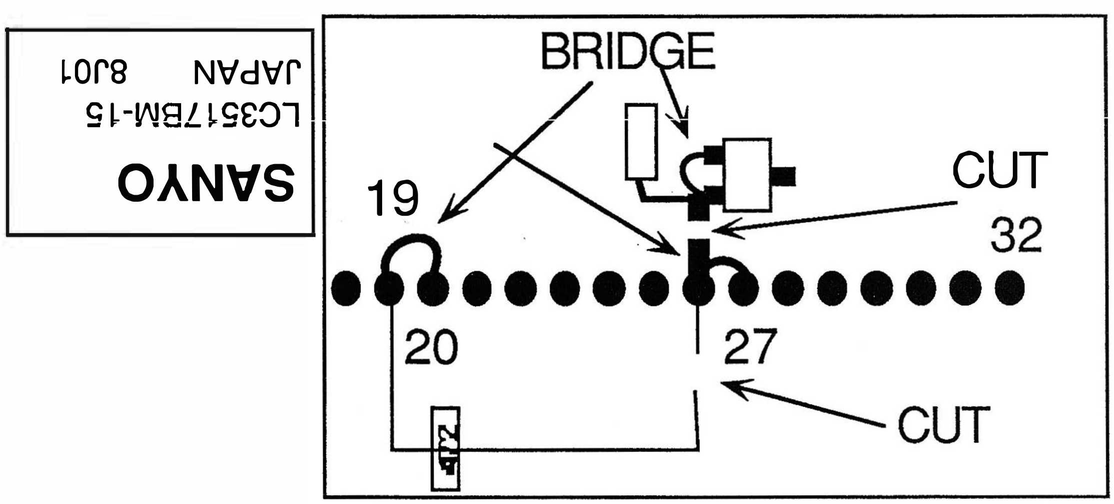
BEARCAT BC-760

LATER MODELS (WITH BNC CONNECTOR)

EXPANDED RF (800MHz)

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case remove the bottom cover.
3. Locate the SANYO IC. (Identification printed upside down with the front of the radio facing you.
4. Locate the long row of solder pins above the Sanyo IC.
5. Locate Pin 26 of the Microprocessor.
6. Cut the two traces leading to pin 26.
7. Solder bridge Pins 19 & 20 together
8. Solder bridge Pins 26 & 27 together.
9. Solder bridge the two leads of the chip transistor above pin 27.
10. Unsolder or cut the 47K Chip Resistor marked "472"
11. Reassemble the radio.





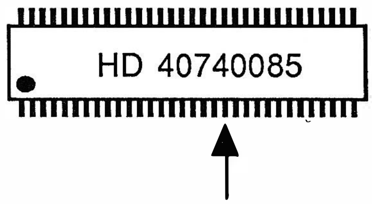
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BEARCAT BC-950

EARLY MODELS (NO BNC CONNECTOR)

EXPANDED RF (800MHz)

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case remove the bottom cover.
3. Locate the microprocessor and clip pin 20.
4. Reassemble scanner.



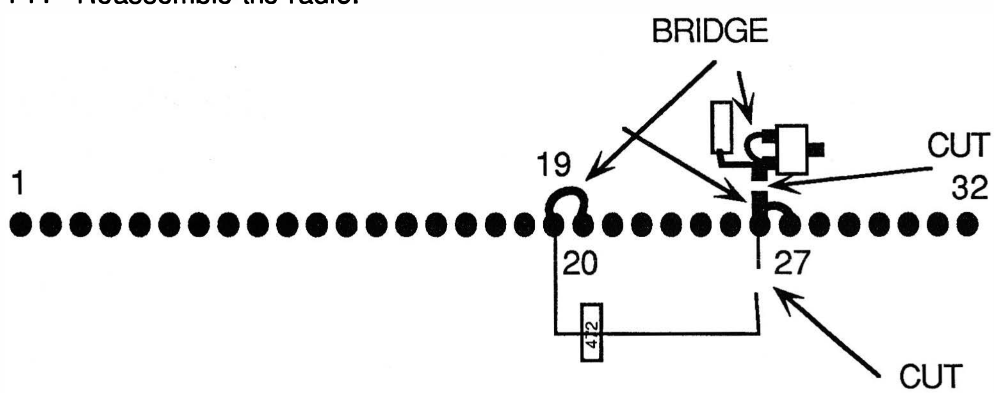
Clip Pin 20

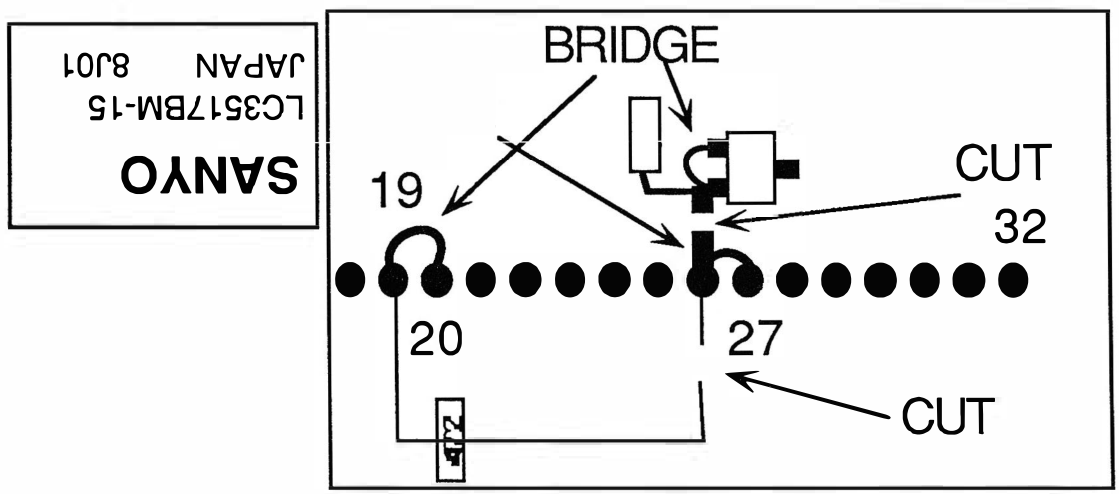
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BEARCAT BC-950XLT
LATER MODELS (WITH BNC CONNECTOR)

EXPANDED RF (800MHz)

1. Remove Power and Antenna.
2. Remove 4 screws from the bottom case remove the bottom cover.
3. Locate the SANYO IC. (Identification printed upside down with the front of the radio facing you.
4. Locate the long row of solder pins above the Sanyo IC.
5. Locate Pin 26 of the Microprocessor.
6. Cut the two traces leading to pin 26.
7. Solder bridge Pins 19 & 20 together
8. Solder bridge Pins 26 & 27 together.
9. Solder bridge the two leads of the chip transistor above pin 27.
10. Unsolder or cut the 47K Chip Resistor marked "472"
11. Reassemble the radio.





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RADIO SHACK PRO-2004

EXPANDED RF (800MHz)
100 additional Memory Channels

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate circuit board PC-3
4. Remove metal cover on top side of PC-3
5. Cut Diode D-513 (800 MHZ Mod)
6. Add a 1N914 or 1N4148 Diode in position D-510.
   Note: Radio Shack part # 276-1122.
   Note: Diode loactions D-510 and D-511 are not labeled
7. Replace metal cover
8. Reassemble radio.

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RADIO SHACK PRO-2005

EXPANDED RF (800MHz)
SCAN SPEED INCREASE.

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate Diode D502. It is located behinf the number 3 key on the keypad.
4. Cut the exposed lead of D502 and push the ends apart.
5. Install a Diode in the empty location D-501. (Speed Increase)
6. Reassmble the radio.

RADIO SHACK PRO-2006

EXPANDED RF (800MHz)
SCAN SPEED INCREASE.

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate Diode D502. It is located behind the number 3 key on the keypad.
4. Cut the exposed lead of Diode D502 and push the ends apart.
5. Cut Diode D-503. (15 Percent speed increase.)
5. Reassmble the radio.

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RADIO SHACK PRO-34

1. Remove Power and Antenna.
2. Remove screws from the case
3. Locate LOGIC circuit board.
4. Locate and cut Diode D11
5. Reassebmle the radio.

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UNIDEN HR-2510

EXPANDED RF

1. Remove Power and Antenna.
2. Remove screws and open the case.
3. Locate the Synthesizer board.
4. Pins 34 & 35 are grounded together on the underside of the synthesizer board. Cut the traces that connect these two pins to ground.
5. Solder one side of a 10K resistor to the connecting point of pins 34 & 35.
6. Connect the other leg of the 10 K resistor to + 5 volts. (where R181 & 187 are connected together.
7. Reassemble radio

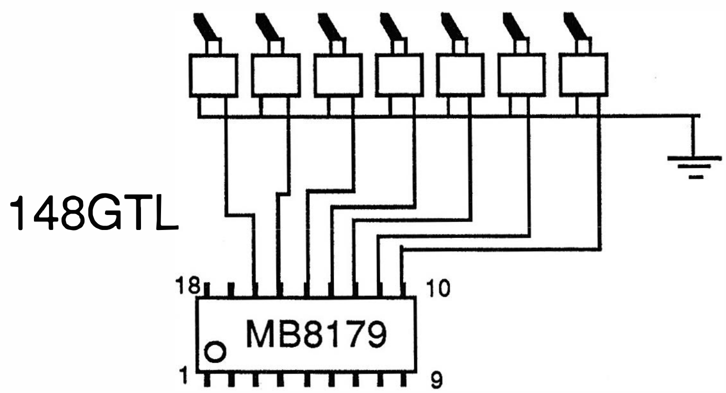
COVERAGE : 26.0000 to 29.9999 MHz

COBRA 148GTL
any other CB using MB8719 IC

EXPANDED RF

Note: This mod requires seven toggle switches to control Frequency. See frequency chart on the next page.

1. Remove Power and Antenna.
2. Remove screws and open the case.
3. Locate Synthesizer chip labeled MB8719
4. Cut wires connecting channel switch and pins 10-16.
5. Solder an on/off switch to each pin (pin 10-16)
6. reassemble radio.



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TRUTH CHART
FOR MB8719 I.C.

Frequency	10	11	12	13	14	15	16	Frequency	10	11	12	13	14	15	16
26.815 =	1	0	0	0	0	0	0	27.455 =	0	0	0	0	0	0	0
26.825 =	1	0	0	0	0	0	1	27.465 =	0	0	0	0	0	0	1
26.835 =	1	0	0	0	0	1	0	27.475 =	0	0	0	0	0	1	0
26.845 =	1	0	0	0	0	1	1	27.485 =	0	0	0	0	0	1	1
26.855 =	1	0	0	0	1	0	0	27.495 =	0	0	0	0	1	0	0
26.865 =	1	0	0	0	1	0	1	27.505 =	0	0	0	0	1	0	1
26.875 =	1	0	0	0	1	1	0	27.515 =	0	0	0	0	1	1	0
26.885 =	1	0	0	0	1	1	1	27.525 =	0	0	0	0	1	1	1
26.895 =	1	0	0	1	0	0	0	27.535 =	0	0	0	1	0	0	0
26.905 =	1	0	0	1	0	0	1	27.545 =	0	0	0	1	0	0	1
26.915 =	1	0	0	1	0	1	0	27.555 =	0	0	0	1	0	1	0
26.925 =	1	0	0	1	0	1	1	27.565 =	0	0	0	1	0	1	1
26.935 =	1	0	0	1	1	0	0	27.575 =	0	0	0	1	1	0	0
26.945 =	1	0	0	1	1	0	1	27.585 =	0	0	0	1	1	0	1
26.955 =	1	0	0	1	1	1	0	27.595 =	0	0	0	1	1	1	0
26.965 =	1	0	0	1	1	1	1	27.605 =	0	0	0	1	1	1	1
26.975 =	1	0	1	0	0	0	0	27.615 =	0	0	1	0	0	0	0
26.985 =	1	0	1	0	0	0	1	27.625 =	0	0	1	0	0	0	1
26.995 =	1	0	1	0	0	1	0	27.635 =	0	0	1	0	0	1	0
27.005 =	1	0	1	0	0	1	1	27.645 =	0	0	1	0	0	1	1
27.015 =	1	0	1	0	1	0	0	27.655 =	0	0	1	0	1	0	0
27.025 =	1	0	1	0	1	0	1	27.665 =	0	0	1	0	1	0	1
27.035 =	1	0	1	0	1	1	0	27.675 =	0	0	1	0	1	1	0
27.045 =	1	0	1	0	1	1	1	27.685 =	0	0	1	0	1	1	1
27.055 =	1	0	1	1	0	0	0	27.695 =	0	0	1	1	0	0	0
27.065 =	1	0	1	1	0	0	1	27.705 =	0	0	1	1	0	0	1
27.075 =	1	0	1	1	0	1	0	27.715 =	0	0	1	1	0	1	0
27.085 =	1	0	1	1	0	1	1	27.725 =	0	0	1	1	0	1	1
27.095 =	1	0	1	1	1	0	0	27.735 =	0	0	1	1	1	0	0
27.105 =	1	0	1	1	1	0	1	27.745 =	0	0	1	1	1	0	1
27.115 =	1	0	1	1	1	1	0	27.755 =	0	0	1	1	1	1	0
27.125 =	1	0	1	1	1	1	1	27.765 =	0	0	1	1	1	1	1
27.135 =	1	1	0	0	0	0	0	27.775 =	0	1	0	0	0	0	0
27.145 =	1	1	0	0	0	0	1	27.785 =	0	1	0	0	0	0	1
27.155 =	1	1	0	0	0	1	0	27.795 =	0	1	0	0	0	1	0
27.165 =	1	1	0	0	0	1	1	27.805 =	0	1	0	0	0	1	1
27.175 =	1	1	0	0	1	0	0	27.815 =	0	1	0	0	1	0	0
27.185 =	1	1	0	0	1	0	1	27.825 =	0	1	0	0	1	0	1
27.195 =	1	1	0	0	1	1	0	27.835 =	0	1	0	0	1	1	0
27.205 =	1	1	0	0	1	1	1	27.845 =	0	1	0	0	1	1	1
27.215 =	1	1	0	1	0	0	0	27.855 =	0	1	0	1	0	0	0
27.225 =	1	1	0	1	0	0	1	27.865 =	0	1	0	1	0	0	1
27.235 =	1	1	0	1	0	1	0	27.875 =	0	1	0	1	0	1	0
27.245 =	1	1	0	1	0	1	1	27.885 =	0	1	0	1	0	1	1
27.255 =	1	1	0	1	1	0	0	27.895 =	0	1	0	1	1	0	0
27.265 =	1	1	0	1	1	0	1	27.905 =	0	1	0	1	1	0	1
27.275 =	1	1	0	1	1	1	0	27.915 =	0	1	0	1	1	1	0
27.285 =	1	1	0	1	1	1	1	27.925 =	0	1	0	1	1	1	1
27.295 =	1	1	1	0	0	0	0	27.935 =	0	1	1	0	0	0	0
27.305 =	1	1	1	0	0	0	1	27.945 =	0	1	1	0	0	0	1
27.315 =	1	1	1	0	0	1	0	27.955 =	0	1	1	0	0	1	0
27.325 =	1	1	1	0	0	1	1	27.965 =	0	1	1	0	0	1	1
27.335 =	1	1	1	0	1	0	0	27.975 =	0	1	1	0	1	0	0
27.345 =	1	1	1	0	1	0	1	27.985 =	0	1	1	0	1	0	1
27.355 =	1	1	1	0	1	1	0	27.995 =	0	1	1	0	1	1	0
27.365 =	1	1	1	0	1	1	1	28.005 =	0	1	1	0	1	1	1
27.375 =	1	1	1	1	0	0	0	28.015 =	0	1	1	1	0	0	0
27.385 =	1	1	1	1	0	0	1	28.025 =	0	1	1	1	0	0	1
27.395 =	1	1	1	1	0	1	0	28.035 =	0	1	1	1	0	1	0
27.405 =	1	1	1	1	0	1	1	28.045 =	0	1	1	1	0	1	1
27.415 =	1	1	1	1	1	0	0	28.055 =	0	1	1	1	1	0	0
27.425 =	1	1	1	1	1	0	1	28.065 =	0	1	1	1	1	0	1
27.435 =	1	1	1	1	1	1	0	28.075 =	0	1	1	1	1	1	0
27.445 =	1	1	1	1	1	1	1	28.085 =	0	1	1	1	1	1	1

COBRA CB's

REMOVE ALC CIRCUIT

1. Remove Power and Antenna.
2. Remove screws and open the case.
3. Locate the indicated part and remove it.
4. Reassemble radio.

MODEL	REMOVE THIS PART
138XLR	TR-23
21GTL	TR-14
25GTL	TR-14
21LTD	TR-14 OR D9
86XLR	CD-9
19PLUS	D-502
142 GTL	TR-32
32XLR	TR-18
21XLR	TR-20
148GTL	TR-24
31PLUS	D-19
29PLUS	R-79 OR D-20
33PLUS	D-17
REMOTE CONTROL	D-401

CAUTION- These Modifications have not been tested. The Author, Publisher and all other parties takes NO responsibility or Liability for any damage or violation resulting from these Modifications. Performing any modification may be a Violation of FCC Rules and will void the Warranty of the radio. Use of any Modified radio may be a violation of FCC Rules. If you have any doubts, DO NOT PERFORM THIS MODIFICATION.

REALISTIC CB's

REMOVE ALC CIRCUIT

1. Remove Power and Antenna.
2. Remove screws and open the case.
3. Locate the indicated part and remove it.
4. Reassemble radio.

MODEL	REMOVE THIS PART
TRC-421	D-16
TRC-462	D-17
TRC-432	Q-12
TRC-473	D-17
TRC-417	Q-19

CAUTION- These Modifications have not been tested. The Author, Publisher and all other parties takes NO responsibility or Liability for any damage or violation resulting from these Modifications. Performing any modification may be a Violation of FCC Rules and will void the Warranty of the radio. Use of any Modified radio may be a violation of FCC Rules. If you have any doubts, DO NOT PERFORM THIS MODIFICATION.

OTHER CB's

REMOVE ALC CIRCUIT

1. Remove Power and Antenna.
2. Remove screws and open the case.
3. Locate the indicated part and remove it.
4. Reassemble radio.

MODEL	REMOVE THIS PART
COLT 222	C-228
FUZZBUSTER 2-50	Q-8
GE 3-5814A	C-98
PACE CB145	CV-20
PEARCE SIMPSON SUPER LYNX	D-12
ROYCE 1-606	D-17
TEABERRY TITAN "T"	D-14
TENNA CB26	D-22
TRAM D-300	TR-23
UTAC TRX-400	D-11
WHISTLER 700	Q-205
WHISTLER 900	Q-305

CAUTION- These Modifications have not been tested. The Author, Publisher and all other parties takes NO responsibility or Liability for any damage or violation resulting from these Modifications. Performing any modification may be a Violation of FCC Rules and will void the Warranty of the radio. Use of any Modified radio may be a violation of FCC Rules. If you have any doubts, DO NOT PERFORM THIS MODIFICATION.

Notes

Radio / Tech Modifications

OTHER MODIFICATIONS

OTHER

AZDEN PCS-6000

EXPANDED RF

1. Remove Power and Antenna.
2. Remove the Top and Bottom covers.
3. Locate and remove the four flat Phillips screws that secure the display to the chassis.
4. Locate and remove the four small Phillips screws securing the PC Board to the chassis.
5. Locate and remove the one Phillips screw above the Microphone connector.
6. Carefully remove the PC board. CAUTION: Do not bend the PIN connectors.
7. Locate and remove Diode D-207. (Unsolder or Cut the diode away)
8. Reassemble the radio.

RANGE: 138.000 MHz - 160.000 MHz

KDK FM-240

EXPANDED RF

1. Remove Power and Antenna.
2. Remove the cover.
3. Press the RESET Button.
4. Enter the new limits on the front panel switch. (Range 140-156 MHz)
8. Reassemble the radio.

RANGE: 140.00 MHz - 156.00 MHz

TEN TEC PARAGON

EXPANDED RF

1. Remove Power and Antenna.
2. Remove the Top cover.
3. Locate and clip small jumper labeled "HAM".
8. Reassemble the radio.

RANGE: 1.7 MHz - 30 MHz

Radio / Tech Modifications

APPENDIX

COAX TYPE	VEL %	dB ATTENUATION PER 100 FEET. 100 MHz	200 Mhz	400 MHz	1000 MHz	LENGTH IN FEET FOR 1 WAVELENGHT 146 MHz	222 MHz	445 MHz
9913 (100% shield)	89	1.4	1.8	2.6	4.5	6.00	3.94	1.97
RG-8U FOAM (8214)	80	1.8	2.7	4.2	7.0	5.39	3.55	1.77
RG-213 (NON-CONTAM.)	66	2.2	3.2	4.7	8.5	4.45	2.93	1.46
RG-8X (MINI-FOAM)	78	3.7	5.4	8.0	13.5	5.26	3.46	1.72
9311 (100% SHIELD 58U)	78	4.5	6.3	9.0	14.5	5.26	3.46	1.72
RG-58U (SOLID CENTER)	66	4.5	6.7	10.0	17.0	4.45	2.93	1.46
RG-58A/U (STRANDED CTR)	66	4.9	7.5	11.5	21.5	4.45	2.93	1.46

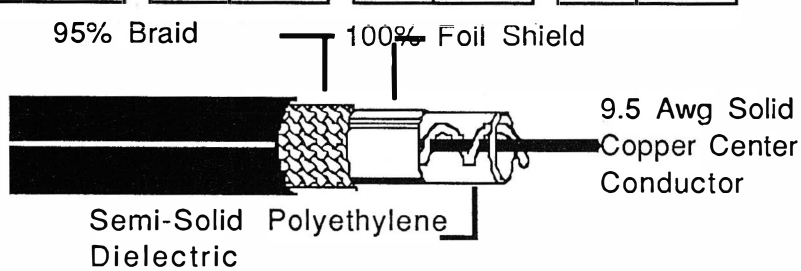
COAX LENGTHS SHOULD BE MULTIPLE HALF WAVELENGHTS.

$$\frac{984}{\text{FREQ. IN MHZ}} \times \text{VEL \%} = \text{ONE WAVE LENGHT IN FEET.}$$

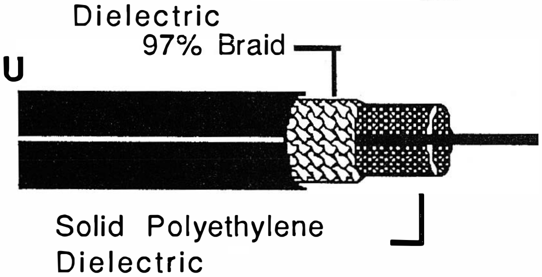
db - % loss chart

db Loss	Power Loss	db Loss	Power Loss	db Loss	Power Loss	db Loss	Power Loss
		2.0	37 %	4.0	60 %	6.0	75 %
0.2	4 %	2.2	39 %	4.2	62 %	7.0	80 %
0.4	8 %	2.4	42 %	4.4	63 %	8.0	84 %
0.6	13 %	2.6	45 %	4.6	65 %	9.0	87 %
0.8	17 %	2.8	47 %	4.8	67 %	10.0	90 %
1.0	21 %	3.0	50 %	5.0	68 %	20.0	99 %
1.2	24 %	3.2	52 %	5.2	70 %	30.0	100 %
1.4	27 %	3.4	54 %	5.4	71 %	40.0	100 %
1.6	30 %	3.6	56 %	5.6	73 %		
1.8	33 %	3.8	58 %	5.8	74 %		

9913

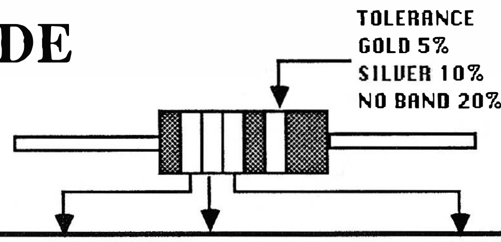


RG-213U

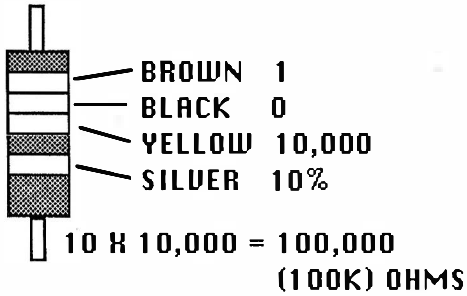


APPENDIX A

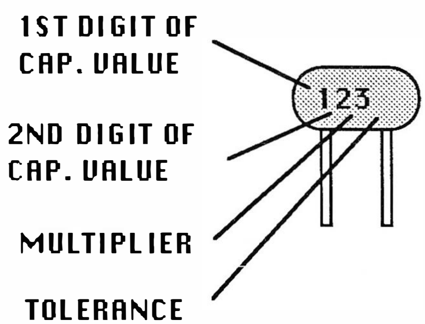
RESISTOR COLOR CODE



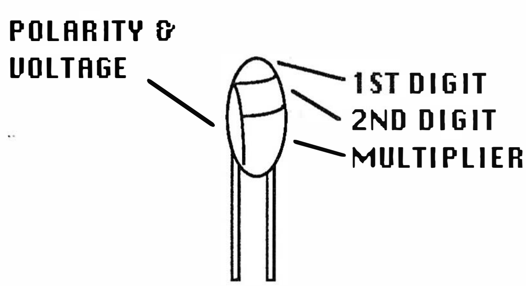
COLOR	1st	2nd	MULTIPLY
BLACK	0	0	1
BROWN	1	1	10
RED	2	2	100
ORANGE	3	3	1,000
YELLOW	4	4	10,000
GREEN	5	5	100,000
BLUE	6	6	1,000,000
VIOLET	7	7	10,000,000
GRAY	8	8	100,000,000
WHITE	9	9	1,000,000,000
GOLD			.1
SILVER			.01



CAPACITORS



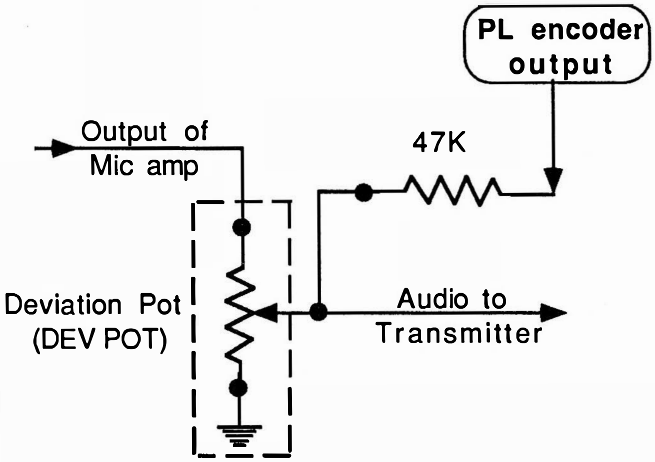
MULTIPLIER		TOLERANCE		
	MULTIPLY BY		10pF or less	over 10pF
0	1	B	0.1pF	
1	10	C	0.25pF	
2	100	D	0.5pF	
3	1,000	F	1.0pf	1%
4	10,000	G	2.0pf	2%
5	100,000	H		3%
		J		5%
8	.01	K		10%
9	0.1	M		20%



COLOR	DIGI	MULTIPLIER	VOLTAGE
BLACK	0	NONE	4
BROWN	1	10	6
RED	2	100	10
ORANGE	3	1,000	15
YELLOW	4	10,000	20
GREEN	5	100,000	25
BLUE	6	1,000,000	35
VIOLET	7	10,000,000	50
GRAY	8		
WHITE	9		

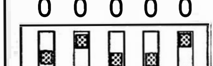
PL ENCODER HOOK-UP

PL Encoder Connections

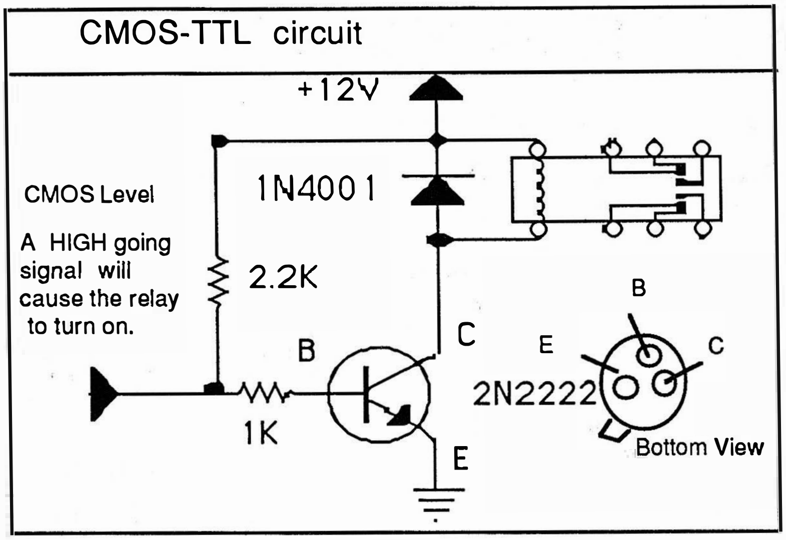


Attach a 47K ohm resistor to the output of the deviation pot. Attach the other end of resistor to the output of the PL encoder.

PL TONE CHART

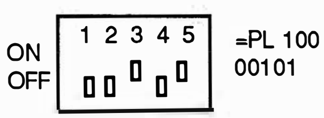
PL TONE	FREQ. CODE	ICOM	YAESU	TS-32 SWITCH 1 2 3 4 5
67.0	-XZ	1	1	1 1 1 1 1
71.9	-XA	2	2	0 1 1 1 1
74.4	-WA	3	36	1 0 1 1 1
77.0	-XB	4	3	0 0 1 1 1
79.7	-SP	5	38	1 1 0 1 1
82.5	-YZ	6	4	0 1 0 1 1
85.4	-YA	7	40	1 0 0 1 1
88.5	-YB	8	5	0 0 0 1 1
91.5	-ZZ	9	42	1 1 1 0 1
94.8	-ZA	10	6	0 1 1 0 1
97.4	-ZB	11		1 0 1 0 1
100.0	-1Z	12	7	0 0 1 0 1
103.5	-1A	13	8	1 1 0 0 1
107.2	-1B	14	9	0 1 0 0 1
110.9	-2Z	15	10	1 0 0 0 1
114.8	-2A	16	11	0 0 0 0 1
118.8	-2B	17	12	1 1 1 1 0
123.0	-3Z	18	13	0 1 1 1 0
127.3	-3A	19	14	1 0 1 1 0
131.8	-3B	20	15	0 0 1 1 0
136.5	-4Z	21	16	1 1 0 1 0
141.3	-4A	22	17	0 1 0 1 0
146.3	-4B	23	18	1 0 0 1 0
151.4	-5Z	24	19	0 0 0 1 0
156.7	-5A	25	20	1 1 1 0 0
162.2	-5B	26	21	0 1 1 0 0
167.9	-6Z	27	22	1 0 1 0 0
173.8	-6A	28	23	0 0 1 0 0
179.9	-6B	29	24	1 1 0 0 0
186.2	-7Z	30	25	0 1 0 0 0
192.8	-7A	31	26	1 0 0 0 0
203.5	-M1	32	27	0 0 0 0 0
210.7		33		

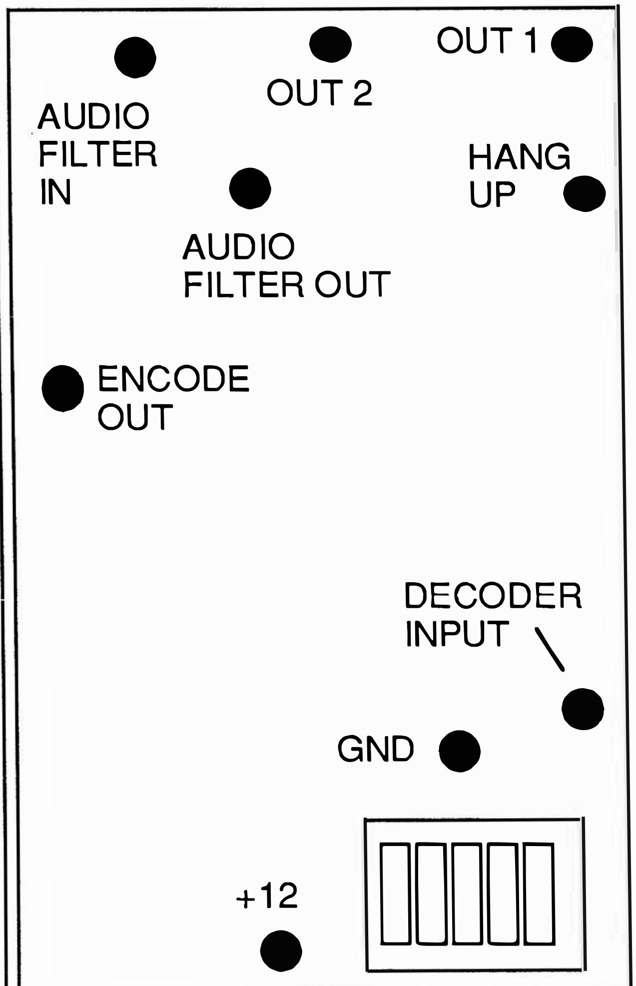
1 = on / 2 = off
example above
01001=107.2



Freq.	1 2 3 4 5	Code#	
67.0	1 1 1 1 1	XZ	1
71.9	0 1 1 1 1	XA	2
74.4	1 0 1 1 1	WA	3
77.0	0 0 1 1 1	XB	4
79.7	1 1 0 1 1	SP	5
82.5	0 1 0 1 1	YZ	6
85.4	1 0 0 1 1	YA	7
88.5	0 0 0 1 1	YB	8
91.5	1 1 1 0 1	ZZ	9
94.8	0 1 1 0 1	ZA	10
97.4	1 0 1 0 1	ZB	11
100.0	0 0 1 0 1	1Z	12
103.5	1 1 0 0 1	1A	13
107.2	0 1 0 0 1	1B	14
110.9	1 0 0 0 1	2Z	15
114.8	0 0 0 0 1	2A	16
118.8	1 1 1 1 0	2B	17
123.0	0 1 1 1 0	3Z	18
127.3	1 0 1 1 0	3A	19
131.8	0 0 1 1 0	3B	20
136.5	1 1 0 1 0	4Z	21
141.3	0 1 0 1 0	4A	22
146.2	1 0 0 1 0	4B	23
151.4	0 0 0 1 0	5Z	24
156.7	1 1 1 0 0	5A	25
162.2	0 1 1 0 0	5B	26
167.9	1 0 1 0 0	6Z	27
173.8	0 0 1 0 0	6A	28
179.9	1 1 0 0 0	6B	29
186.2	0 1 0 0 0	7Z	30
192.8	1 0 0 0 0	7A	31
203.5	0 0 0 0 0	M1	32

1 (ON) CLOSED
0 (OFF) OPEN

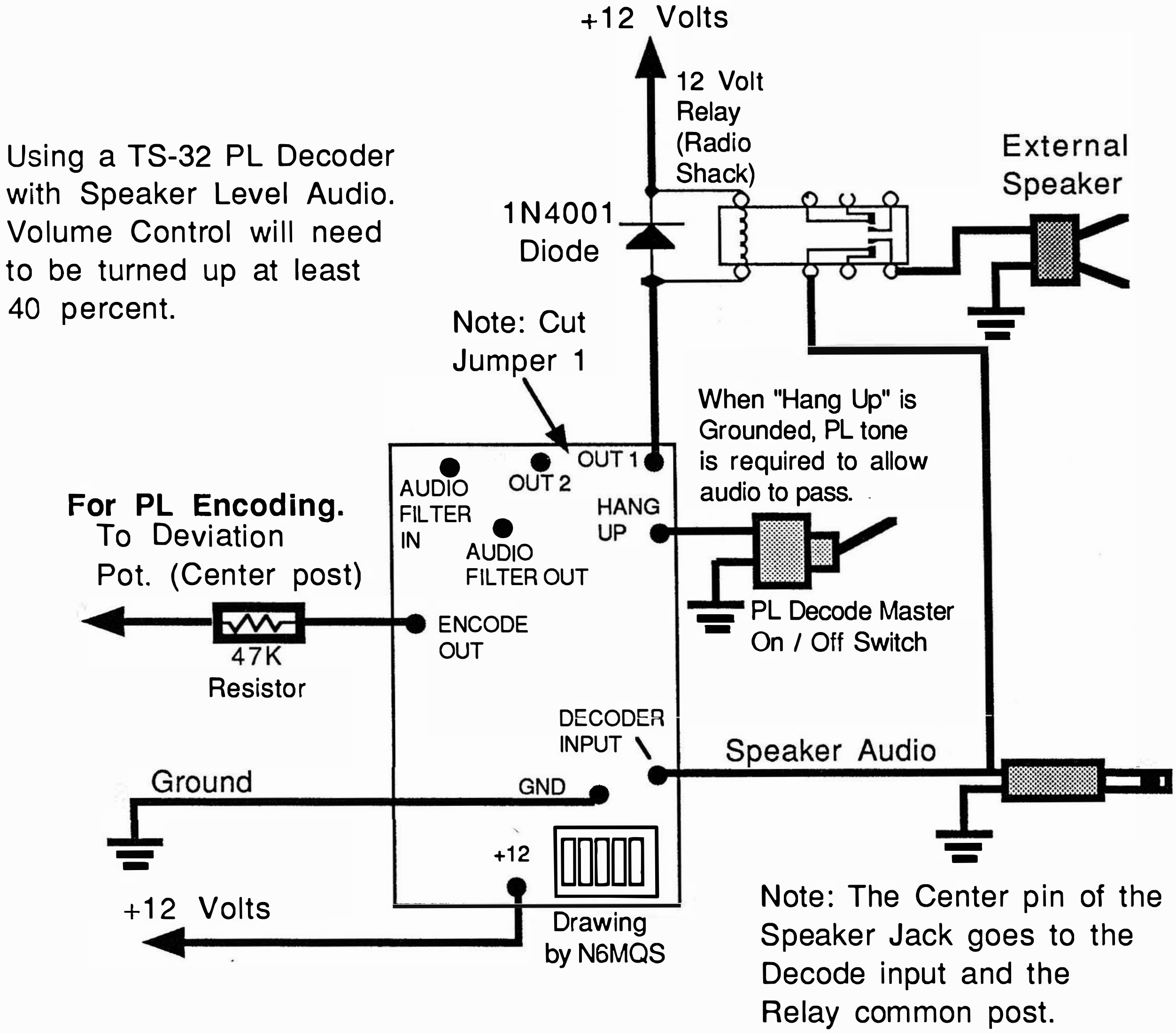




TS-32 LAYOUT

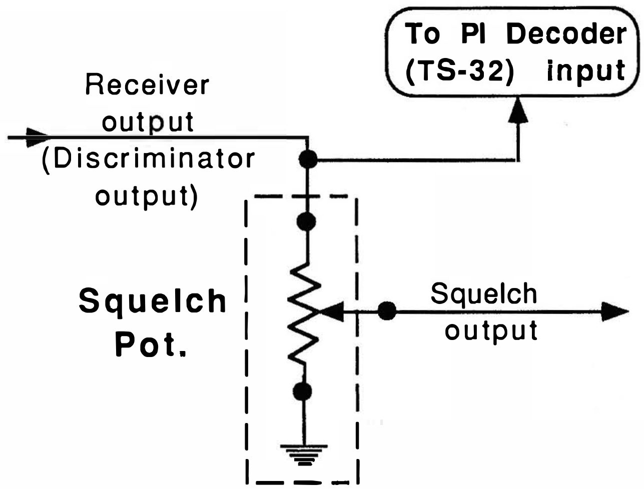
TS-32 Hookup

PL Decoder



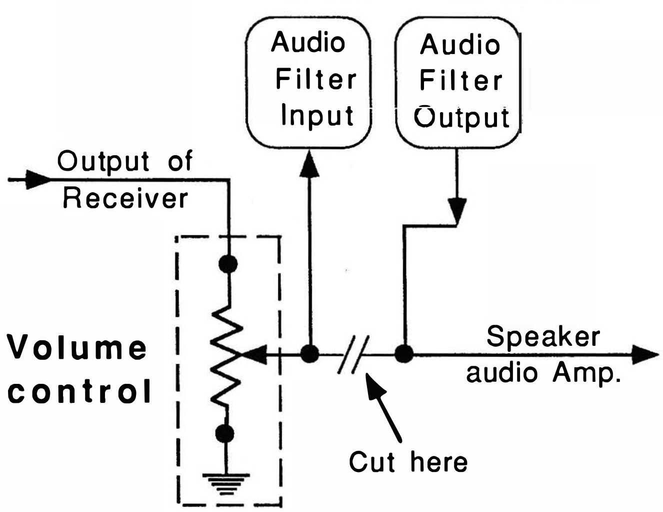
PL Decoder HOOK-UP

PL Decoder Connections



Attach a wire to the discriminator output. Attach the other end to the Decoder input. The discriminator output is often connected to the squelch pot. See Audio connections below for audio control.

PL Decoder/Audio Connections



Audio muting is controlled by the TS-32 Board. When a PL is present on the signal, audio will pass.

MEMORY CHANNEL ASSIGNMENTS

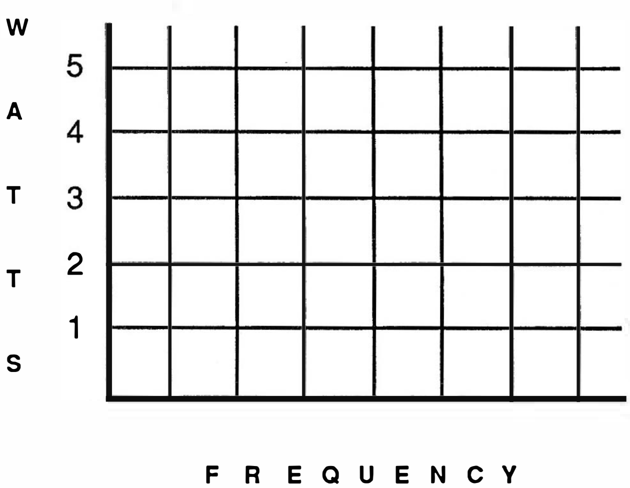
##	FREQ.	DESCRIPTION	##	FREQ.	DESCRIPTION
1			51		
2			52		
3			53		
4			54		
5			55		
6			56		
7			57		
8			58		
9			59		
10			60		
11			61		
12			62		
13			63		
14			64		
15			65		
16			66		
17			67		
18			68		
19			69		
20			70		
21			71		
22			72		
23			73		
24			74		
25			75		
26			76		
27			77		
28			78		
29			79		
30			80		
31			81		
32			82		
33			83		
34			84		
35			85		
36			86		
37			87		
38			88		
39			89		
40			90		
41			91		
42			92		
43			93		
44			94		
45			95		
46			96		
47			97		
48			98		
49			99		
50			100		

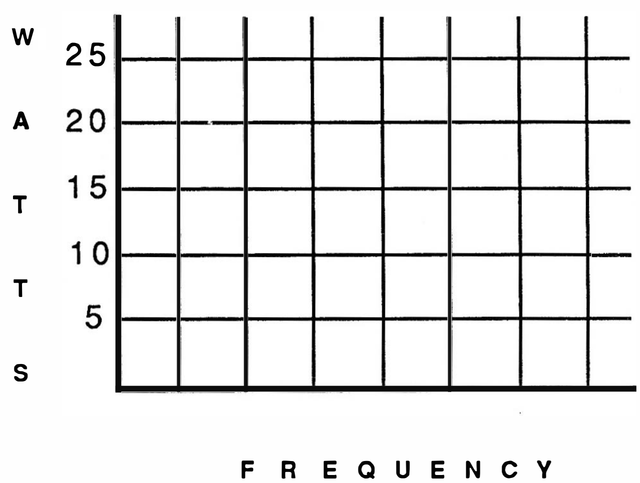
Performance Report

Radio ______________________________ Date ______________

Owner : Name____
Address____
City____________________________ St. ________ Zip ________
Phone ( ) -

Description	Before	After
Power out (Low)	________Watts	________Watts
Power out (High)	________Watts	________Watts
Frequency Error (Simplex)	________Hz	________Hz
Frequency Error (Offset)	________Hz	________Hz
Receive Sensitivity (Mid-band)	________uv	________uv
PL Deviation	________Hz	________Hz
DTMF Deviation	________KHz	________KHz
Audio Deviation	________KHz	________KHz
Lowest usable Freq @ .5 Pwr	________MHz	________MHz
Highest usable Freq @ .5 Pwr	________MHz	________MHz





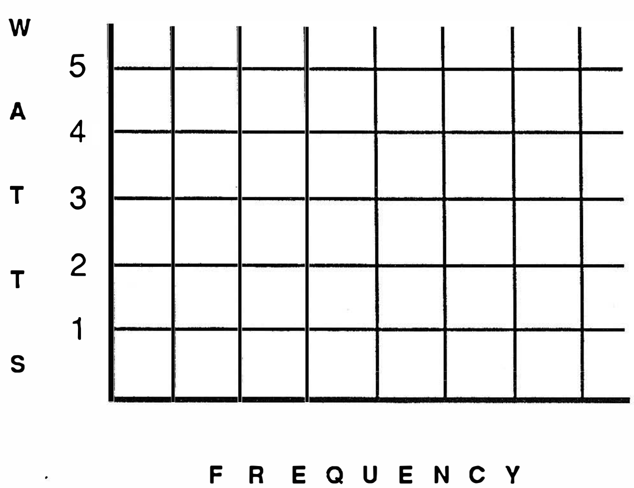
Notes

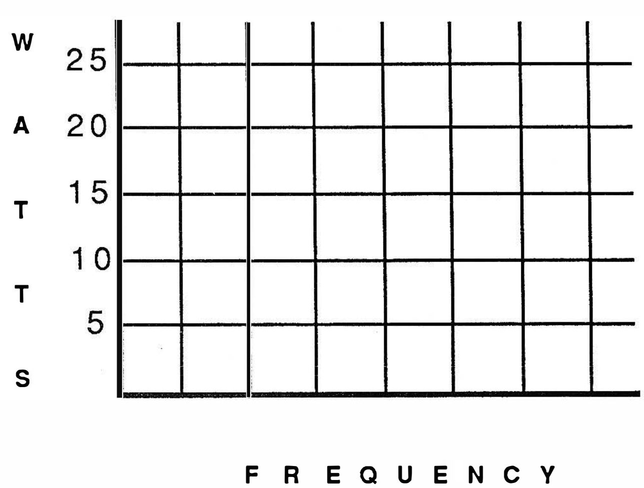
Performance Report

Radio ______________________________ Date ____________

Owner : Name ____
Address ______________________________________
City ________________________ St. ______ Zip ______
Phone ( ) -

Description	Before	After
Power out (Low)	________Watts	________Watts
Power out (High)	________Watts	________Watts
Frequency Error (Simplex)	________Hz	________Hz
Frequency Error (Offset)	________Hz	________Hz
Receive Sensitivity (Mid-band)	________uv	________uv
PL Deviation	________Hz	________Hz
DTMF Deviation	________KHz	________KHz
Audio Deviation	________KHz	________KHz
Lowest usable Freq @ .5 Pwr	________MHz	________MHz
Highest usable Freq @ .5 Pwr	________MHz	________MHz





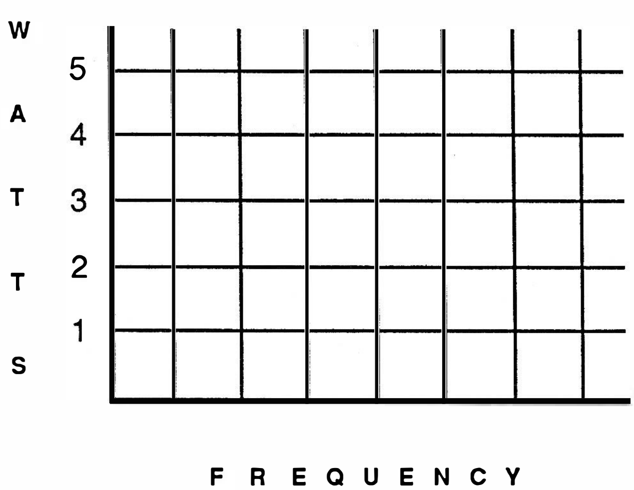
Radio / Tech Modifications

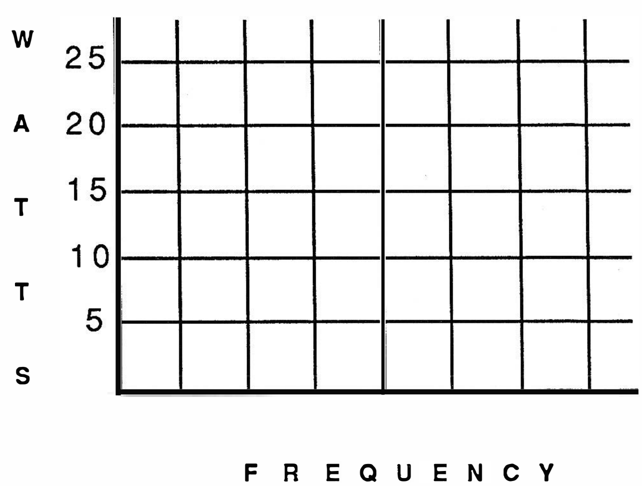
Performance Report

Radio ______________________________ Date ____________

Owner : Name____
Address______________________________________
City__________________________ St. ______ Zip ______
Phone ( ) - ______________________________

Description	Before	After
Power out (Low)	________ Watts	________ Watts
Power out (High)	________ Watts	________ Watts
Frequency Error (Simplex)	________ Hz	________ Hz
Frequency Error (Offset)	________ Hz	________ Hz
Receive Sensitivity (Mid-band)	________ uv	________ uv
PL Deviation	________ Hz	________ Hz
DTMF Deviation	________ KHz	________ KHz
Audio Deviation	________ KHz	________ KHz
Lowest usable Freq @ .5 Pwr	________ MHz	________ MHz
Highest usable Freq @ .5 Pwr	________ MHz	________ MHz



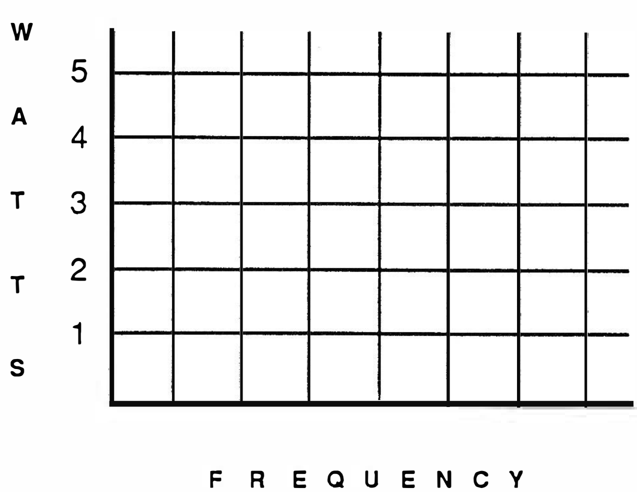


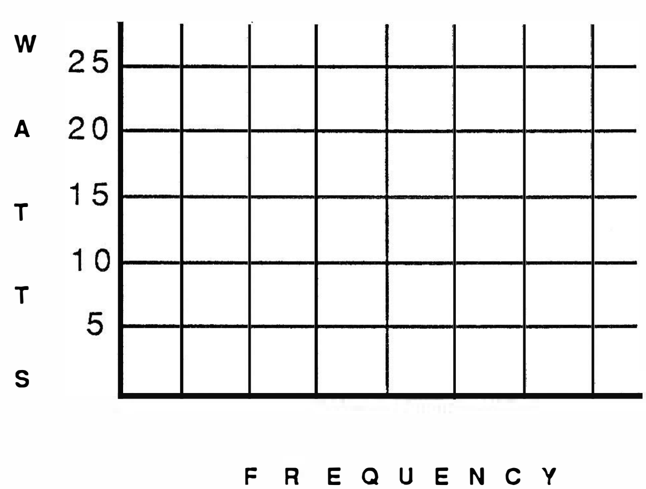
Performance Report

Radio ______________________________ Date ____________

Owner : Name______________________________________
Address____________________________________
City______________________ St.________ Zip______
Phone (   )   -

Description	Before	After
Power out (Low)	________Watts	________Watts
Power out (High)	________Watts	________Watts
Frequency Error (Simplex)	________Hz	________Hz
Frequency Error (Offset)	________Hz	________Hz
Receive Sensitivity (Mid-band)	________uv	________uv
PL Deviation	________Hz	________Hz
DTMF Deviation	________KHz	________KHz
Audio Deviation	________KHz	________KHz
Lowest usable Freq @ .5 Pwr	________MHz	________MHz
Highest usable Freq @ .5 Pwr	________MHz	________MHz



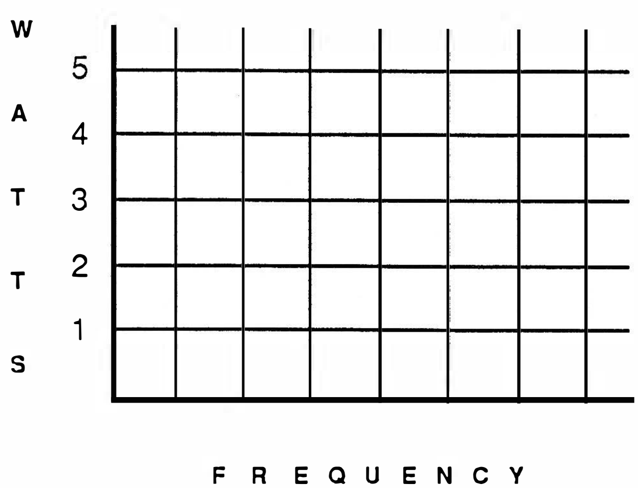


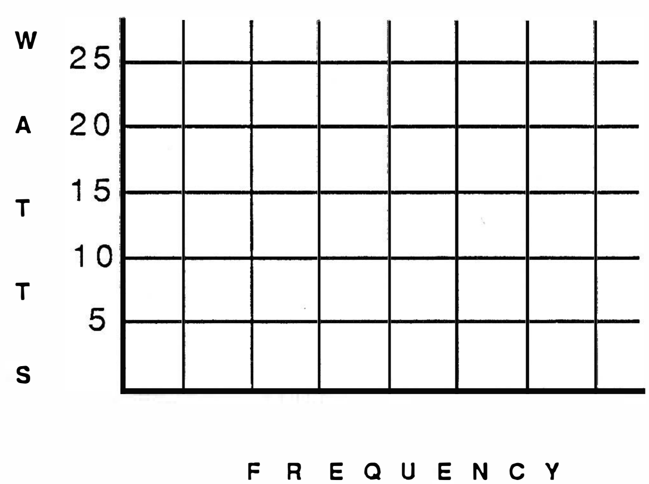
Performance Report

Radio ______________________________ Date ____________

Owner : Name____
Address______________________________________
City______________________________ St. ________ Zip ________
Phone ( ) -

Description	Before	After
Power out (Low)	________Watts	________Watts
Power out (High)	________Watts	________Watts
Frequency Error (Simplex)	________Hz	________Hz
Frequency Error (Offset)	________Hz	________Hz
Receive Sensitivity (Mid-band)	________uv	________uv
PL Deviation	________Hz	________Hz
DTMF Deviation	________KHz	________KHz
Audio Deviation	________KHz	________KHz
Lowest usable Freq @ .5 Pwr	________MHz	________MHz
Highest usable Freq @ .5 Pwr	________MHz	________MHz



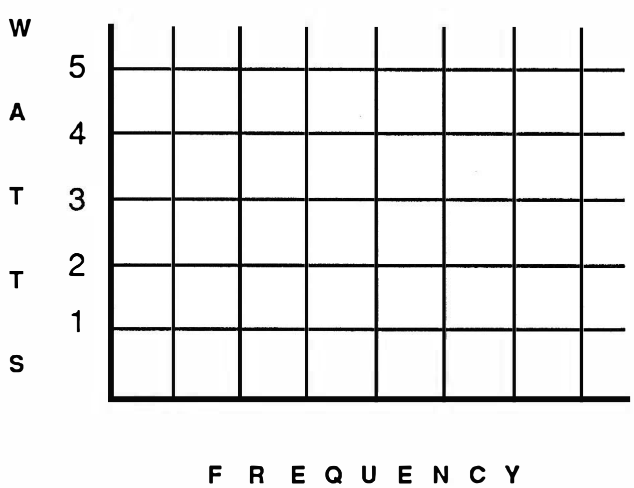


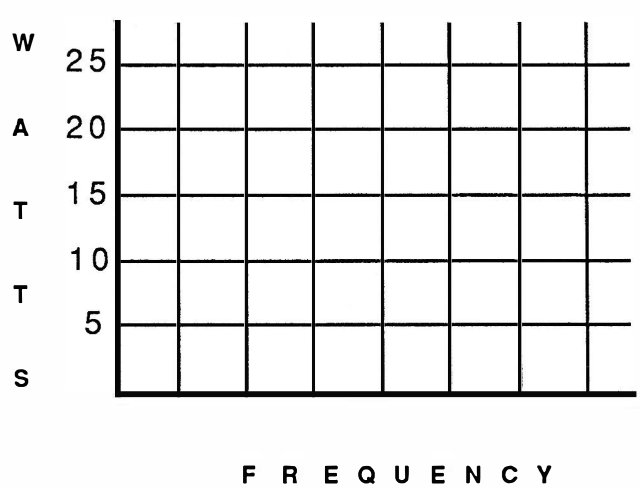
Performance Report

Radio ______________________________ Date ____________

Owner : Name______________________________________
Address____________________________________
City__________________________ St.______ Zip______
Phone ( ) - ____________________________

Description	Before	After
Power out (Low)	________Watts	________Watts
Power out (High)	________Watts	________Watts
Frequency Error (Simplex)	________Hz	________Hz
Frequency Error (Offset)	________Hz	________Hz
Receive Sensitivity (Mid-band)	________uv	________uv
PL Deviation	________Hz	________Hz
DTMF Deviation	________KHz	________KHz
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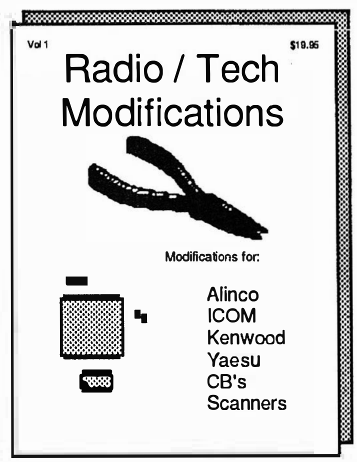
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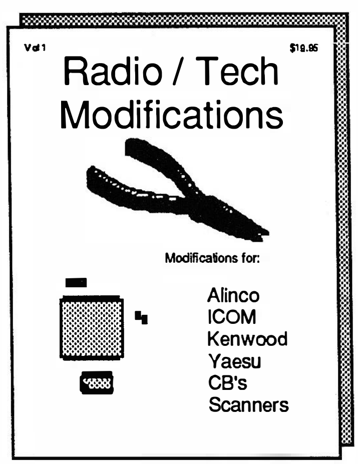
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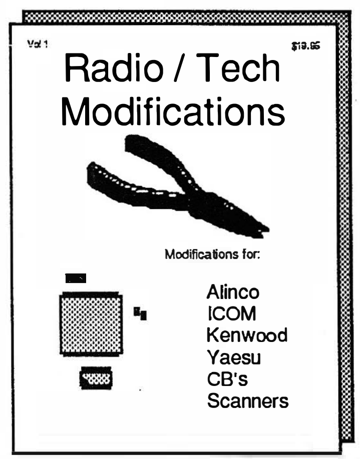
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